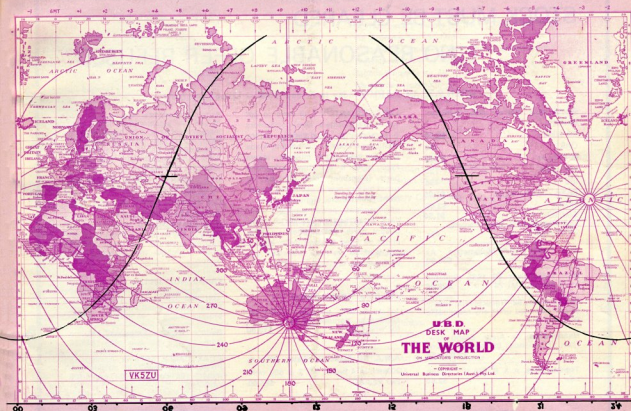


# amateur radio

NOVEMBER, 1973



## VK5 SPECIAL ISSUE

- A WIDE-BAND PRE-AMP FOR THE FTDX401 AND FT200
- AN ANTENNA FOR 160 METRES
- MOBILE ANTENNA FOR 40
- "S" METERS FOR AMATEUR RECEIVERS
- THE THEBARTON PROJECT
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JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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### FRONT COVER:

Mercator map of the world marked with great-circles based on Adelaide  
with bearing increments of 15 degrees. Black curves show solar ter-  
minator at 22nd July.  
(See article on page 14).

The Executive has heard rumours and misinformed comments about the 2m and 70cm bands. A member of the Executive saw senior officials at a joint meeting on 10th October to establish facts.

The re-opening of the FM Broadcasting enquiry by the Minister for the Media, has led to speculation about our vhf-uhf bands. This is because "x" number of MHz in the spectrum is required for this new service. Internationally the FM broadcasting band runs from 88 to 108MHz but the ABCB Report on the subject could not recommend this in Australia because of TV channels 4 and 5. Instead 470-510MHz was preferred with 500-540MHz as the next best. The band width of 40MHz was suggested as desirable.

A fresh Enquiry on the subject is expected to be announced soon for a Report to be made to the Minister in the New Year. The Executive will of course make submissions because once again all the VHF and UHF frequencies will come under scrutiny — ALL the frequencies and not solely the amateur bands. Everything points to the continued exclusive use of our entire 2m band but nevertheless, because it is in the vhf area, it will be looked at.

The technical administrators clearly state there are no intentions against our 2m band and none could be supported. One or two isolated MHz are of little use in the context referred to above.

The status of the 70cm band however is different. Amateurs have 420-450MHz on a secondary basis and here are 30MHz not too far away from 470MHz. The primary user in this part of the spectrum is probably too deeply entrenched to be molested in any way. The Executive however has set up a Committee to look at this band. We have no exclusive use of any frequencies between 148MHz and 24GHz but this seems to be of little concern to anybody else because of the severe pressures on the available spectrum. The last Space Conference showed all too clearly how the amateur service needed support.

The public in Australia do not hold 'Hams' in much favour either. The adverse and often ignorant press and other publicity has seen to this. Commercial interests also could wield a powerful lobby.

The Federal Council and the Executive are able and willing to engage in battle. Are you ready to assist in every way you can? To always operate and behave responsibly, reasonably and intelligently and encourage others to do the same **MUST CONTINUE TO BE THE WATCHWORD**. Improve our image in the eyes of the public. Use our frequencies to the full.

Unfortunately there is a minority refusing to conform. Their unconformity could be our undoing under the pressures building up around us.

John McL. Bennett, VK3ZA.

Most of the articles in this edition of "Amateur Radio" have been supplied by the South Australian Division. This was not done to bolster our ego (after all, we know we are the Division with the mostest), but to prompt other Divisions into supplying a similar batch of material for subsequent issues.

"Amateur Radio" is our only printed link. We claim to be competent communicators, but how many people in other Divisions know of activities such as our headquarters project.

At this year's Federal Convention it was suggested that perhaps VK2 could supply copy for February, VK3 March, VK4 April, and so on, finishing with VK9 for September. While this would be an ideal situation for the magazine committee, it is probably an impossible dream.

Or is it?

Perhaps you could give the suggestion further thought while reading through our efforts. We hope you enjoy them.

The VK5 Division.

#### SPEED OF LIGHT.

QST for June 1973 quotes from Optical Spectra that NBSL scientists have concluded that light travels at a velocity of 299 792 458.2 Km per second  $\pm 1.1$  metres. This is equivalent to 186 282 396.0 miles per second  $\pm 3.8$  feet. This is almost the time taken for bad news to travel around Australia.

#### Historical.

"The article '50 Golden years of Broadcasting' (Aug. '73 AR) was of particular interest to me, being one of the original staff of 6WF in 1924 when the station operated on 1250 metres and 104.5 metres. Wally Coxon, VK6AG and Bill Phipps VK6WP were the engineers."

(Note from VK6MY of Atkins Carlyle Ltd. of Perth).

#### Interference

"The APO at the request and expense of the Board, investigates causes of interference to the reception of broadcasting and television programmes and furnishes advice and assistance to listeners and viewers as to how these troubles might be minimised. During the year ended 31 May, 1973 16,422 complaints (4032 col and 12390 TVI) complaints were lodged. The cost of investigating complaints to 30 June, 1973 was \$233,868". Australian Broadcasting Control Board 25th Annual Report for year ended 30 June, 1973.

#### THE AMATEURS.

"What good are amateurs?" — "What do they do?" — "Can they serve any useful purpose?" The quick answer is, of course, that the mere fact of there being nearly 500,000 in the world of the West as a whole, is by itself a good enough reply to these questions. If no

benefits flowed or advantages accrued from the pursuit of Amateur Radio, it could not possibly exist on such a scale — and continue to expand at the rate it does. Editorial Short Wave Mag. July '73.

#### RADIO STATION STATISTICS.

At 30th June 1973 there were 5563 licensed amateurs showing an increase of 41 in the 6 month period to that date. Licensed mobile stations however increased by 17 771 to 156 110. Of the 6478 continental VK stations 4419 were full calls and 2051 restricted licences: 2045 (1450 full and 595 limited) were in NSW, 2012 (1125 — 717) were in Victoria, 758 (525 — 233) in Queensland, 748 (500 — 248) in S. Australia, 516 (373 — 143) in W. Australia, 224 (148 — 76) in Tasmania and 117 (88 — 29) in ACT with 50 (40 — 10) in the NT. 93 (80 — 13) amateurs were listed as being in the territories of whom 81 (68 — 13) were in TPNG.



# The Thebarton Project

VK5 Division of the Wireless Institute of Australia

Rarely is the Wireless Institute associated with world famous architects. Such a momentous event is taking place in VK5, where the Division is in the process of converting a building designed by Walter Burley Griffin into the Divisional headquarters. The following article describes the trials and tribulations of firstly, obtaining a building, and secondly, converting it.

For some fifteen years the VK5 Division has been putting the profits from disposals and equipment sales into a Building Fund. Like many such funds, the growth of the fund has been far slower than the rise in building prices and it looked as if we were doomed to meet in rented halls for ever, as well as relying on members good graces to store equipment in their homes. In 1969 two or three members

started private investigations into possible sites for headquarters buildings. After several different proposals had been followed up, the matter was put to the general membership, and at a Special General Meeting in mid-1971 a committee was appointed to determine our requirements and find a suitable home for us.

This committee, commonly known as the Headquarters Committee, was chaired by Rob Wilson 5WA. To this day Rob is not sure how he was landed with the job, but the committee worked magnificently and the results are a credit to its members. Heaven only knows how many properties they looked at, from private houses, through bakeries, to disused churches. Bear in mind that the Building Fund stood at less than \$3000, which limited their bargaining powers somewhat. One rather attractive offer of a block of land 66ft x 460 ft fell through when we found that we were expected to erect a \$20000 building with no guarantee of continued tenancy.

After six months of hard work, the committee hit the jackpot — the Thebarton Council indicated that they were prepared to

offer us their municipal rubbish destructor building. When the raucous laughter died down we found that we were being offered an architectural masterpiece designed by Walter Burley Griffin, the man responsible for the initial planning and design of Canberra. While in Australia to work on the Canberra project, Burley Griffin also carried out other architectural and town planning jobs, including several municipal rubbish destructor buildings.

The building we were offered consists of three floors (see sketch) and an attached room. Although it does not have a room suitable for general meetings (the largest area will take about 800 at a squeeze), it was considered that the rented hall in the Adelaide city area was satisfactory for these, while the building could be used for VHF, YRCS, SWL and WICEN meetings. The separate attached room was ideal for 5WI, while the top floor was earmarked for a YRCS lecture room. One of the most attractive features was a 50ft. high chimney on which to mount the beams and terminate long wires.

BELOW — The chimney at Thebarton, shortly due to be topped with beams for 20 metres and higher.

BELOW — Burley Griffin believed, amongst other things, in making his buildings solid. That hole represents two hours work with the jack hammer.





**ABOVE —** Secretary Ross VK5KF signs the lease for the new HQ building under the eagle eyes of Rob VK5WA chairman of the Building Committee, and Geoff VK5TY, Divisional President. Barry VK5-ZAU ensures the occasion is suitably recorded in the minutes.

Negotiations were commenced with the Council, and after 15 months, largely due to delays in the preparation of lease documents, we were the proud possessors of a BUILDING, on a ten year renewable lease, annual rental \$15!! And what a building.

Work started on the Sunday after Easter 1973; the first jobs being to throw out all the movable junk and remove the soil which had been dumped against the building since it was last used in 1957. Having tossed out all the smaller items (nothing over 300 lbs in weight) into the conveniently located pug-hole outside the back door, we tackled big headache number one — the furnace.

Sitting sullenly in the middle of the basement floor, this consisted of a steel box 16ft by 12ft by 8ft high, filled, or so it seemed, with firebricks. All the edges and corners were reinforced with 3" x 3" angle, the sides braced with back to back 6" x 3" channel, and the whole lot bolted together with 1/2" nuts and bolts with the bolt heads concealed on the inside. One Saturday afternoon with an oxy-cutter and the nuts were removed from the end nearest the pug-hole. Four weeks later the pug-hole was full of firebricks, the steel plate was cut into manageable sections and stacked ready for removal, and we could see the length of the basement.

The chimney, future support for massive beams and long wires, presented a totally different problem. We could not find a way into it! Several nights work with torches and

hand lanterns peering through odd holes in the brickwork and climbing round inside the furnace flues, and the problem was solved. To get into the chimney, go down, young man, through the basement floor. One flue channel below the floor led directly into the chimney. Granted, the opening was only about three feet wide and two feet high, but it was big enough for a man to get through and stand up inside the chimney.

Although the chimney is square on the outside, this is only a disguise for the actual, round, chimney inside. Brickwork was cheap in 1937, and the round chimney did not fit the design of the building. The internal diameter of the chimney is about 4ft, and a ladder will be built, from 5ft sections, inside it so we can erect the aerials; (five feet sections are the largest it is possible to fit through the flue opening). We will assemble it inside the chimney and fasten it to the wall as it goes up. Two of our older members have offered to pre-fab the sections at home and to deliver

**BELOW —** Burley Griffin believed in making even the most mundane building beautiful.



them ready to be erected in the chimney by some of the younger, more agile members. Conveniently, there is a small flue that feeds into the chimney just below the floor of the 5WI room, so the coax cables will not have to disappear into the basement first.

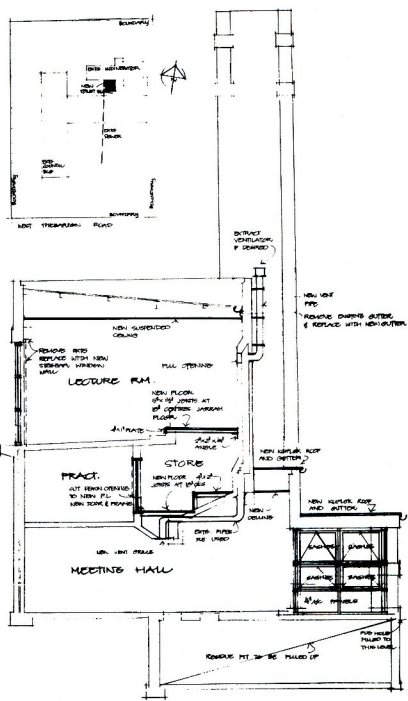
To guide our work we had a set of plans drawn up by Bruce Bussenschutt, VK5OR of Turner, Bussenschutt and Associates who spent considerable time deciphering prints of the original drawings and turning them into a form suitable for interpretation by radio amateurs. The only errors we have found so far have been due to incorrect information on the original drawings; minor things such as showing the internals of the furnace to be mirror images of the final product. Bruce just smiled, made the necessary adjustments, and left the bill at zero.

All jobs have their ups and downs. Who would have thought that the 9 ft high brick retaining wall was actually a brick-faced, 9" thick, reinforced concrete structure, and was located just where the toilet block had to go. That caused a certain amount of blood, sweat and pure Australian language, but eventually it succumbed. The ceiling of the basement was jet black with soot and bituminous residue from the furnace. Burning off with blow lamps was only partially successful, but one Sunday the workers borrowed the Council's fire hose to clean the floors and found that the ceiling muck washed off if hit hard enough with a jet of water. In about an hour we had a clean ceiling, and so far nothing has reappeared from within the concrete. The same technique is working marvels elsewhere in the building, and the time saved cannot be estimated.

On-the-spot supervision and coordination of the effort has been the responsibility of Barry Williams 5ZBQ, and Geoff Taylor 5TY. Supervision in this sense is interpreted as; "If there's no-one else available, do it yourself, mug". So far about 50 members have assisted on the job, ranging from junior associates to Roy Cook 5AC, who held a licence before World War I, and makes an admirable gatekeeper to keep out undesirable and let in the workers. Till now all the work has been voluntary, but we are in the process of sub-contracting out the erection of the toilet block as this requires certain specialized trades and will be built much quicker by weekday labour.

The Thebarton Council has been more than cooperative. Not everyone would allow a team of radio amateurs unrestricted access to their property at all hours of the night and day, and more important make equipment such as concrete mixers, tractors, air compressors and wheel barrows available without charge. Without their assistance the job would have been harder and more expensive. With only weekends available we found the whole building turned round to face the road". The building would look better that way, so . . .

We hope to have the basement room ready for meetings by mid-November, and to complete all essential work on the rest of the building by late January. After that, of course, come the finer details, like the



Building plan of the floor layout

establishment of a garden in the old pug-hole. While the work will probably never be finished in the 5WI room (another tran-

smitter, better audio gear, etc.) we will at least be in our own home and working for ourselves.

# IMPORTANT NOTICE

As announced in "Amateur Radio" individuals may apply to the Department of Customs and Excise for By-Law on a H.F. Transceiver.

We will be glad to assist with your transceiver requirement from the Yaesu range. All we need is your By-Law Certificate and a written authority to use it for By-Law admission of the transceiver of your choice from our bulk imports, either when a shipment arrives or from bond storage. Immediate delivery cannot always be guaranteed, but perhaps this is a small price to pay considering the Duty concession.

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FT-101B .....	579
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FT-501 .....	605

**NOTE** That the FT101B is a new model just released, obtainable in Australia **ONLY** from B.E.S. The FT101B incorporates a cooling fan installed, all bands including 160M as well as a new and superb plug-in noise blander.

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DC-75 .....	49
FP-200 .....	90
FP-501 .....	90
DC-200 .....	135

VFO for FT-75 (Model FV-50C)..... \$45

Subject to the model of transceiver desired, we will be pleased to provide forms for a By-Law application together with the required information, on receipt of your order with deposit (20% of concession prices shown).

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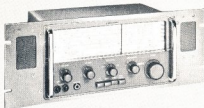
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# communication in the VK5 division

Geoff Taylor, VK5TY, Federal Councillor.

"In any division there is always the problem of passing information on to the members. As radio amateurs we are expected to be experts in communication, but radio is not necessarily the best way of passing on information. In VK5 a two-pronged attack is made using radio, via the Divisional broadcasts and the printed word in the *Divisional Journal*. Both have their problems but these are not insoluble to keen amateurs."

No Division can function without some form of communication among the members. Most members seem content with what they hear from other operators on the air, but there is always a need for some form of formal communication. The Divisional broadcast is one form of communication, but not everyone is in a position to hear it because of other commitments. To ensure that information is available to all members, some form of printed sheet is necessary.

In VK5 we make maximum use of both outlets. As we have no headquarters building as yet, all the work is carried out in members' homes. This involves considerable liaison and cross-town travelling.

The Divisional broadcast is prepared by Ian 5ZKT and Adrian 5AW. They arrange the program, edit taped submissions, arrange

interviews, and tape the entire session ready for playback on the Sunday morning. The tape is complete with cue-ing and tune-up signals for the relay stations, and identification pauses. It is delivered to Bart 5GZ who is the official 5WI operator. The program originates from Bart's home on 1.8 MHz AM using a Viking transmitter purchased by the Division some time ago.

The 1.8 MHz signal is received and relayed by various members on the other bands. Due to the geographic layout of the VK5 Division, from Mount Gambier in the South to Darwin in the North, Renmark in the East to Ceduna in the West, no one frequency can hope to supply an adequate cover. The relays are on 3.5MHz AM by Murray 5ZQ; 7.0MHz AM by Ross 5KF; 14MHz SSB by Geoff 5TY; 52MHz AM by Bob 5MM; 144MHz by John 5AWI; and FM Channel 4 by Jim 5NB.

Additionally there are relays on 2 metres in Darwin by Colin 8CM and Mount Gambier by Colin 5DK. Each relay station takes a callback after the broadcast with the exception of the FM Channel 4 transmission. We also have a number of stations that stand-by to substitute for the regular operators at holiday time and during other absences.

For the written word we have the SA Divisional Journal. This is a duplicated, foolscap sized magazine issued at least six times a year to all members of the VK5 Division. Minimum size for several years has been 8 sheets (16 pages) and lately it has been running something like 12 sheets per issue. The Journal contains technical articles (some of which are reprinted in this copy of

"Amateur Radio"), Oscar predictions, VHF and SWL notes, Federal notes, official communications from Council, general Divisional information, members advertisements, and last but not least, details of items available from the Equipment Supply Committee. We also include paid advertisements from local trade organizations.

Again, as with 5WI all the work associated with the Journal is done in private homes. Editing and printing is carried out by Tom 5QP on the Institute's duplicator set up in the kitchen. Bob 5MM as Technical editor rewrites articles and draws circuit diagrams to his own high standards. Address plates are looked after by Ross 5KF, and the addressing is done by Junior Associate, Marian, under the eye of Geoff 5TY.

Journal assembly is organised by Wally 5TW who gathers a group of "volunteers" at his home, wearing out his carpet while tramping round the table picking up sheets, and then eating (and drinking) him out of house and home. The Journals are then bulk posted to members.

We are fortunate that John 5UL was successful in obtaining a Class A postal permit for the Journal as this reduces the postage to a reasonable sum. As it is, by the time the extra amount is paid for airmail delivery to VK8 members, the bill for 600 copies is about \$13.

The Journal is now in its fourteenth year. Over this period it has had several editors and printers, the most outstanding service being by Brian 5CA and his wife Marlene who, for eight years, typed, edited, printed and collated the Journals at their home, as well as printing the wrappers. Marlene's greatest worry always being that she might not have enough supper for the collators — an entirely unjustified fear.

With the possibility of a headquarters in the near future we hope to extend and enlarge the coverage of both 5WI broadcasts and the Journal. It is the efforts of volunteers in these activities which has made the VK5 Division what it is today — the best informed and most active Division in Australia! ●

## 1973 AUSTRALIAN RADIO AMATEUR CALL BOOK

- Obtain your copy from your Division, Bookseller or write to:—

'Magpups', P.O. Box 150,  
Toorak, Vic., 3142.

- Continuously up-dated through Bail's Inserts in AR— this service is available only to members.

**\$1.20 plus 20c postage**



ABOVE — Colin VK8CM at Darwin takes the 20 metre relay of VK5WI and retransmits it on 2 metres for the Darwin group. Reception is by a TH3 beam to a FTDX100 receiver. The audio is then fed to a TCA1675 and from there to a beam.



# a wide-band pre-amp for the FTDX 401 and FT 200

Kerry Adams, VK5SU

Lambell Street, Caduna, 5690

This wide band amplifier is suitable for many modern transceivers including the Yaesu F series. No originality is claimed; it is a combination of circuits and ideas drawn from many sources.

Using 9 volt positive regulated supply from the FTDX401, the gain is slightly below unity at 3.5MHz, while rising to 10dB at 15MHz (12dB is obtainable with a 15 volt supply). The gain falls slowly to unity at 54MHz. I find that the FTDX401 is quite satisfactory up to 21 MHz requiring only 30-35 microvolts RF CW in to produce an S9 signal. At the other end of the scale, 28MHz requires between 60 and 80 microvolts to achieve the S9.

My preamplifier was built on a small bit of vero board, 8 holes by 11 holes and laid out like the circuit. The only adjustment is to the midge trimmer capacitor C1. Tune up the transmitter on about 28.6 MHz, and do not touch the pre-selector tuning control after tuning up the unit. Then peak C1 for maximum RF noise on a signal generator or antenna. This capacitor compensates for the lower input capacitance of the TIS88 compared to the 6BZ6.

The 100pF capacitor from the RF amplifier switch to the 6BZ6 grid is lifted off the grid and run to the preamplifier. The 1000PF output from the OC170 then goes to the 6BZ6 grid.

No cross modulation has been observed to date even from an FT200, yards away, or an FTDX560 200 yards away in the same street. All of us can operate to within about 20KHz on any of the HF bands with only slight desensitisation with Yaesu gear.

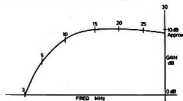
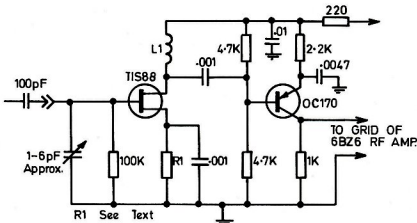


FIG. 2 - RESPONSE OBTAINED USING SWEEP GENERATOR

Many FT401 owners have noticed that the 2MHz spread of 28MHz does not track too well. I fixed mine by the addition of a 3-30 midge trimmer between the RF amplifier switch position D, and earth (4 switch positions are in parallel). Approximately all the capacitance is required. Check across the range while retuning the capacitor and aerial coil. The transmitter and receiver pre-selector tuning is now identical, even if the gain on 28MHz has dropped a little in the process of acquiring proper tracking. This makes the pre-amplifier even more desirable. ●



WIDE BAND PRE AMP FOR THE FTDX401 - FIG 1

R1 220ohms nominal, values increased via a spare wafer on band change switch in FTDX401 so that gain of pre-amplifier is altered to suit band in use, i.e. more resistance gives less gain.

L1 8 turns of bell wire round a pencil.

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# extraordinary convention

The Extraordinary Convention held in Melbourne on 15th and 16th September dealt mainly with 2M repeater frequencies as briefly reported in QSP of last month's AR. The opportunity of holding discussions with all Federal Councillors was too good to be missed and was used to maximum advantage.

One outstanding question was the constitutional position arising out of the formation of the A.C.T. Division and that Division's application to join the Federal body. The thinking on this crystallised during a debate on such Constitutional Matters as the absence of proportional voting provisions about which additional work was commissioned. Many problems affecting AR were discussed at length including the impending increases in postage rates and the continuing improvements in organisation which are going on all the time as well as those which have been noted for implementation within the most stringent financial limitations imposed upon the Executive.

Another matter which has been, and still is, the subject of great thought is the vexed question of Convention costs and how to keep these at the lowest possible level consistent with the essential function of meeting together to transact business.

Among the other matters discussed was the use of our EDP system to greatest advantage. This affects members in relation to such areas as subscriptions processing, AR addressing labels and membership cards. EDP also bears heavily on the small Executive office engaged in a multitude of other functions necessary to the administration of the central organisation. ●



Tony Mulcahy VK2ACV, Don Miller VK2GN (Alternate FC), Ian Mackenzie VK2ZIM (observer), Russell Kelly's nose VK3NT, Peter Williams VK3IZ (observer), Peter Zinden VK3BX (observer), Ian Binnie VK2ZIU (observer), Lawrie Blagbrough VK4ZGL.



Left to right: Ted Cruise VK7EJ (with glasses and cigarette), Kev Connelly VK3ARD ●, John Bennett VK3ZA ●, the WIA PR expert, Peter Dodd VK3CIF, Michael Owen VK3KI ●, David Wardlaw VK3ADW ●, Federal President, Jack Martin VK3TY ● Vice-President.



Tony Mulcahy, 2 visitors in the background, Geoff Taylor VK5TY, Ian Champion VK5WB (observing), Neil Penfold VK6NE, Phil Fitzherbert VK3Jff (observing), Peter Frith VK7PF (observer) and Ted Cruise.

## an antenna for 160 metres

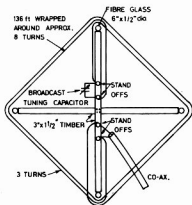
Reprinted from South Australian Wireless Institute Journal October 1972.

The antenna we described has shown improved results over the various dipoles and long wires that had been used in the past. Compared with the other antennas, this one shows a couple of "S" points more.

I have been able to copy K4SGU at 559, and VK5DV's signal, which was not so strong here at Balaklava, is now up another couple of "S" points.

The antenna is basically a one element yagi with a tuned winding and a low impedance link.

To construct the antenna you will need 2 pieces of timber 6' x 3" x 1 1/2" to form the cross, 136 ft. of 20-22 s.w.g. enamel wire to form the main tuned winding, and enough 20-22 s.w.g. enamel wire to wind on three turns to form the link. Four pieces of glass fibre rod, about 1/2" diameter and 6" long from an old fishing rod, four small stand off insulators to terminate the ends of the wire and a single gang



160 METRE ANTENNA

broadcast type capacitor (mounted as close as possible to the stand off insulators) are also needed.

The construction of the antenna is as follows. Screw the two pieces of timber together to form a cross, and across the ends of the timber screw the four pieces of fibre glass rod. Attach one end of the 136 ft. length of wire to an insulator, these insulators having first been mounted in pairs as shown in the diagram. Wind on all the wire and attach the end to the adjacent insulator. This will be about eight turns. Now wind on the three turns, attaching the ends to the other set of insulators.

Mount the single gang condenser to the boom as close as possible to the stand-offs that are connected to the 136 ft. length of wire, and connect to the ends. Attach 70 or 50 ohm co-ax to the ends of the three turn link and the antenna is ready.

The final step is to peak the capacitor for maximum signal strength and the antenna is then complete. ●

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Further 2 Metre equipment, **Ken, Belcom, Swan & Yagi** antennas, check September/October ads. Also, 12V DC 3-3.5A regulated 240V power supplies **\$26** only.

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# mobile antenna for 40

Les Diener, VK5NJ/M

Reprinted from South Australian Wireless Institute Journal May 1973.

Mobile antenna systems certainly present a never ending field for experiment, and whether used on the V.H.F. or Low Frequency bands, each will have some merit and de-merit.

The conventional centre loaded type is without question as good as any, both from a "short-haul" and DX standpoint. However, this type of mobile antenna (particularly on the low frequency bands) has the following disadvantages.

1. Critical construction and adjustment including attachment to the vehicle, and a means of stowing in the vehicle when not in use.
2. Deflection, particularly when travelling at high speed or in a strong head wind. This causes the resonant frequency to change slightly as the top section is pulled away from the metal of the vehicle. This effect is most severe when using a metal caravan.
3. Sharp tuning and narrow band width, usually  $\pm 15$  kHz "f" resonance.
4. Height above the vehicle.

With some reservations, the well known "helical" overcomes most of these problems quite well, and, if accurately tuned and matched to the transmission line, performs comparably to the centre loaded type.

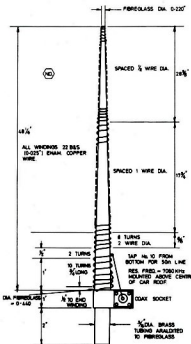
Over recent years, my efforts with helicals have not, until now, been comparable with results using a centre loaded system. However, when noting the excellent signals from various other mobile users using helical whips one cannot but agree with their possibilities.

At this point, I pay tribute to Hughie, VK5BC, who has done a great deal of experimenting with L.F. mobile antenna systems, and has given me many useful hints and tips which have largely accounted for my success with the helical described in this article. Vern, VK5VB, has also done a great deal of experimental work with helicals for portable operation where total height is of no importance, and with very satisfactory results. But this antenna is primarily intended for mobile operation, total height above the vehicle being only 4 feet.

For the interest of "home-brew" types like myself who want to go mobile on 7 MHz details are given of the actual construction used, but variables, such as diameter of the fibreglass rod, rate of taper, etc., will determine the changes necessary in final tuning. However, provided the resonant frequency and matching are accurately adjusted, performance should be the same. Being strictly a monoband antenna, separate antennas of this type will be needed for each band chosen, but the 40 metre version may be used as a guide.

## PERFORMANCE

1. Operation up to 40 kHz either side of the resonant frequency is quite feasible without encountering high v.s.w.r. problems. (This is not possible with centre loaded types.)



2. A contact with JASAFU/MM, 900 miles south of Adelaide at RS57 was made (other contacts within the normal 40 metre range appear about equal to those made in the past using a centre loaded antenna of 8ft. length).
  3. The helical antenna may be left mounted on a bar over the vehicle roof, and raised or folded down as required.
  4. The total height above ground is 8 feet 9 inches.
  5. S.W.R. when correctly matched is 1.1 to 1.
- Finally salutations go to Phil, VK5NN, for his R.F. noise bridge data (ref. A.R. July and October 1971), for matching to 50 ohms was possible to the "enth" degree using the bridge I have constructed to Phil's amended detail using a pair of 2N3693's.

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## CLUB/ZONE/DIVISION NEWS

● The Publications Committee wishes to advise that the call on AR for space to print material is so great it is not possible to include a section devoted to Divisional, Zone or Club news.

● Arrangements were made with all Divisions that such news would appear in Divisional Bulletins if so required, and accepted by Divisional Bulletin Editors. Bulletins, when submitted, are carried as inserts in AR mailed to members of the Division concerned.

● It has been agreed however that AR should include an Events Diary to contain very brief details of forthcoming events. Items for this Diary MUST reach the Editor not later than the 1st of the month prior to publication.

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# making the most of Mercator

A. M. Phillips, VK5ZU

27 Prospect Terrace, Prospect, 5082

Having recently joined the ranks of those who operate rotatable beams on the HF bands, the writer took a critical look at the generally accepted methods of direction-finding and decided to explore the feasibility of using the well known Mercator projection. This article develops a simple graphical method of plotting great-circles for any point on the earth's surface, having specified the latitude of the point and the great-circle bearing. The technique is then further developed to determine the position of the solar terminator at any time.

## GREAT-CIRCLE BEARINGS

The generally accepted method of determining great-circle bearings appears to be by using the equidistant azimuthal chart 1,2. However, this has several distinct disadvantages, namely:

1. Available charts are centred on selected points only, and these are generally few and far between.
2. Distortion around the perimeter makes pin-pointing difficult.
3. Fine map detail is lacking.

The use of a globe overcomes the first two difficulties but fine detail is expensive to obtain and considerable manipulation is required to obtain readings.

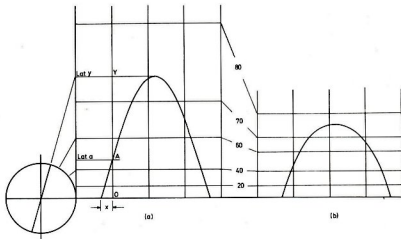


Fig. 1a—  
Mercator's projection.  
Horizontal scale varies as sec  
latitude.  
Vertical scale varies as sec  
latitude.  
Therefore bearings are correct at all  
points.

Fig. 1b—  
Simple cylindrical projection.  
Horizontal scale varies as sec  
latitude.  
Vertical scale varies as sec  
latitude.

A line having bearing "b" will have slope cot b on Mercator's projection and (cot b . sec latitude) on the simple cylindrical projection.

Consideration was therefore given to what could be done with the widely used wall-type map based on Mercator's projection Fig. 1.

In the simple projection — Fig. 1a — the horizontal scale varies as the secant of the latitude while the vertical scale varies as (secant)<sup>2</sup> of the latitude. In the Mercator projection — Fig. 1b — the horizontal and vertical scales both vary as the secant of the latitude so that bearings are correct at all points on the map; hence its wide use in navigation.

The simple projection, however, has the characteristic that any great-circle projects as a sine curve symmetrical about the equator. This provides the basis for a fairly simple calculation to define a particular great-circle, having given its bearing at a particular latitude. (See Appendix).

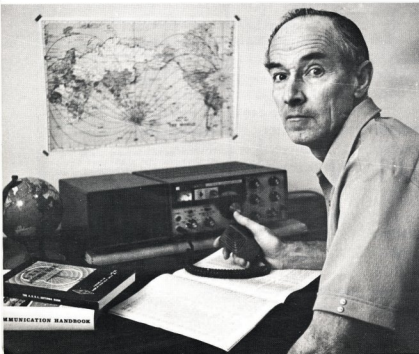
Given point A whose latitude is "a" and the great-circle whose bearing at point A is "b", then the values of "y" (the maximum latitude of the great-circle) and "x" (its equatorial intercept with respect to A) are found to be

$$y = \arcsin \sqrt{(s^2 + \tan^2 a)}$$

$$x = \arcsin (s \cdot \cot y)$$

$$s = \cot b \cdot \sec a$$

Values for "x" and "y" were first calculated as in the appendix, but this method is tedious unless one has access to a desk calculator. With a little more thought and the help of Pythagoras, the relationship shown in Fig. 2 was discovered.



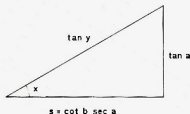


FIG. 2

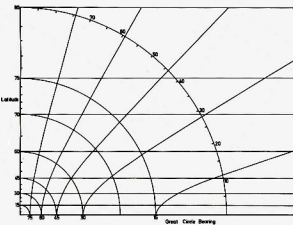


Fig. 3—Universal Great-Circle Calculator

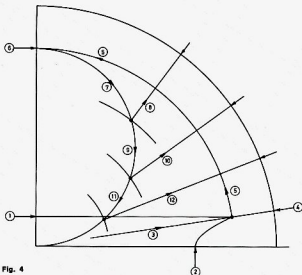


Fig. 4

- 1 Enter latitude of the reference point. (35 deg.)
- 2 Enter bearing of the desired great-circle. (15 deg.)
- 3 Project from origin through intersection of 1 and 2.
- 4 Read off angular value of  $x$ . (8.5 deg.)
- 5 Describe a circular arc from intersection of 1 and 2 to the vertical axis.
- 6 Read off latitude value  $y$ . (77.5 deg.)
- 7 Construct a semicircle on the vertical axis and note point of intersection with next significant latitude circle. (Lat. 75 deg.)
- 8 Read off angular value of  $x'$  for Lat. 75 (54 deg.)
- 9
- 10 Read off angular value of  $x'$  for Lat. 70 (36.5 deg.)
- 11
- 12 Read off angular value of  $x'$  for Lat. 60 (22 deg.)

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- good, clear, glossy photos welcomed with open arms. do not forget captions.
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TABLE 1

Degrees longitude from 0600 or 1800 hours to Solar Terminator at latitude shown.

Latitude	Days from equinox					
	15	30	45	60	75	90
20	2.3	4.4	6.4	7.9	8.8	9.1
30	3.7	7.2	10.2	12.5	14.0	14.5
40	5.6	10.5	14.9	18.4	20.6	21.4
50	7.7	15.0	21.4	26.6	29.9	31.1
60	11.2	22.1	32.1	40.6	46.5	48.7
65	13.8	27.7	41.1	53.6	63.9	68.5
66.4	-	-	-	-	-	90
67.3	-	-	-	-	90	
69.4	-	-	-	90		
70	17.9	36.6	57.4			
73.0	-	-	90			
75	24.7	54.0				
77.8	-	90				
80	39.5					
83.6	90					



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## EXAMPLE:

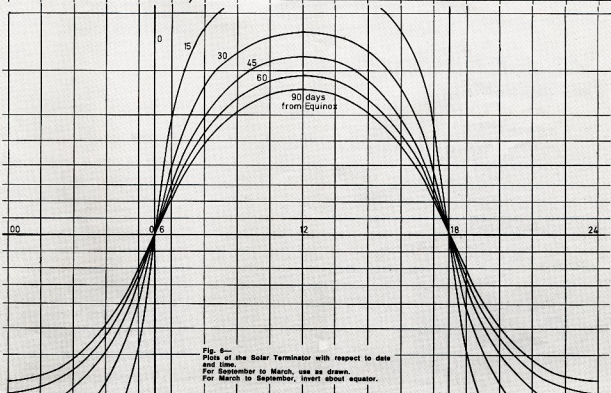
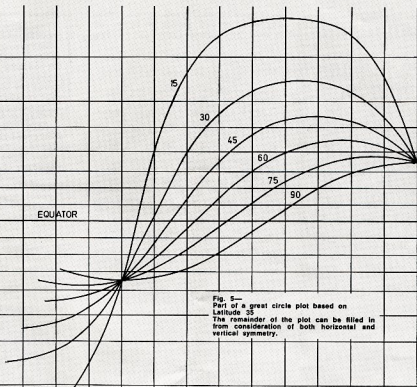
For a point at Latitude 35 degrees, compute great-circles with bearing increments of 15 degrees.

a = 35 deg.	tan a = 0.7002			tan <sup>2</sup> a = 0.4903		
b	15	30	45	60	75	90
cot b	3.732	1.732	1.000	0.577	0.268	0.000
sec a	1.221					
s = cot b . sec a	4.556	2.114	1.221	0.705	0.327	0.000
$s^2$	20.757	4.471	1.490	0.497	0.107	0.000
$s^2 + \tan^2 a$	21.247	4.961	1.981	0.987	0.597	0.490
tan y = $\sqrt{s^2 + \tan^2 a}$	4.609	2.227	1.407	0.994	0.773	0.700
y	77.7	65.8	54.6	44.8	37.7	35.0
cot x = $\frac{s}{\tan y}$	0.988	0.949	0.867	0.709	0.423	0.000
x	8.7	18.3	29.8	44.8	65.0	90.0

Intermediate points on each of the above curves can then be calculated by using the relationship  $\tan a' = \tan y \cdot \sin x'$   
e.g. For great-circle bearing 015 deg.

a'	20	40	60	65	70	75
tan a'	0.364	0.839	1.732	2.145	2.747	3.732
tan y	4.609					
sin x' = $\frac{\tan a'}{\tan y}$	0.079	0.182	0.376	0.465	0.596	0.810
x'	4.5	10.5	22.1	27.7	36.6	54.0





The complete plotting data can be summarised as follows:

Latitude	Longitude from equatorial intercept - x'					
a'	b = 15	30	45	60	75	90
10	-	-	-	10.2	13.2	14.6
20	4.5	9.4	15.0	21.5	28.1	31.3
30	-	-	-	35.5	48.3	55.5
35	8.7	18.3	29.8	44.8	65.0	90
37.7	-	-	-	-	90	
40	10.5	22.1	36.6	57.6		
44.8	-	-	-	90		
50	-	32.3	57.9			
54.6	-	-	90			
60	22.1	51.0				
65	27.7	-				
65.8	-	90				
70	36.6					
75	54.0					
77.7	90					

## APPENDIX

In Fig.1 let the earth radius be the unit of length and assume the earth to be a perfect sphere.

Then  $OY = \tan y$

$$OA = \tan a = \tan y \cdot \sin x \quad \text{-----}(1)$$

Let  $s = \text{slope at A}$

$$\begin{aligned} s &= d/dx \tan y \cdot \sin x \\ &= \tan y \cdot \cos x \quad \text{-----}(2) \\ s^2 &= \tan^2 y \cdot \cos^2 x \\ &= \tan^2 y - \tan^2 y \cdot \sin^2 x \end{aligned}$$

and from (1) above

$$\begin{aligned} s^2 &= \tan^2 y - \tan^2 a \\ \text{hence } \tan^2 y &= s^2 + \tan^2 a \\ \text{and } y &= \arcsin \tan \sqrt{s^2 + \tan^2 a} \quad \text{-----}(3) \end{aligned}$$

and from (2) above

$$x = \arccos \frac{s}{\tan y} \quad \text{-----}(4)$$

For a line having a true bearing  $b$  at point A

$$s = \cot b \cdot \sec a \quad \text{-----}(5)$$

This forms the basis for a universal graphical calculator - Fig. 3.

Both axes are set out as tangent scales, the vertical being calibrated to show latitude and the horizontal to show great-circle bearings. Additional curves are then plotted to give the appropriate value of "cot b sec a" at each value of latitude "a".

The calculator is used as shown in Fig. 4. Tabulated data for latitude 35 deg. obtained by calculation is shown in the appendix and very close agreement is obtainable by the graphical method.

Fig. 5 shows a part-plot of these values on a Mercator chart.

Note: In plotting, first locate the equatorial intercept with respect to the reference point. Then measure all longitude values from the equatorial intercept, NOT FROM THE REFERENCE POINT.

Because bearings are correct at all points on a Mercator chart, back-bearings from the remote end of a great-circle path can also be determined. This can be useful if the other party to a contact is not sure of his correct beam heading.

## THE SOLAR TERMINATOR.

Since ionospheric propagation is dependent on solar activity, it is useful to know the extent of the solar illumination of the earth at any time. The perimeter of the illuminated area, the terminator, is also a great-circle, the location of which can be determined by the same general methods outlined above.

As the sun moves along the ecliptic, its declination and the extreme latitude of its terminator vary as follows:

Days from equinox.	Declination.	Extreme latitude of terminator.
0	0	90
15	6.4	83.6
30	12.2	77.8
45	17.0	73.0
60	20.6	69.4
75	22.7	67.3
90	23.4	66.2

Using the values in Column 3 and the methods outlined above, the data in Table 1 has been calculated. From this the family of curves shown in Fig. 6 has been plotted, together with the appropriate time lines. If this data is plotted on a transparency, it can be superimposed on the Mercator map with freedom to move in the East-West direction and used to indicate the daylight and dark regions of the earth's surface and also the local time at any place.

Note: Easier readability is obtained if a master-plot is made and the appropriate curve is traced on to the transparency as required.

The above is based on mean solar time which can differ from apparent solar time by as much as 16 minutes. However, correction for the "equation of time" can easily be made in the tracing process if required.

## REFERENCES

- 1 Radio Communication Handbook: RSGB Fourth Edition, pages 12.22 - 12.24
- 2 The ARRL Antenna Book Twelfth Edition, Chapter 13

# Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmullen Rd., Boronia, Vic., 3155

## "S"-meters for Amateur Receivers

In February's column I discussed the value of an "S"-meter in a receiver. I suggest that you read that before getting busy on your receiver with holecutters, etc.

In its simplest form an "S"-meter consists purely of a low value milliammeter connected in the cathode or emitter circuit of one of the AGC controlled stages. With no signal input, the valve or transistor draws a certain current which diminishes in the case of a valve and can either increase or decrease in the case of a transistor. The amount of variation depends on the signal strength, although not necessarily linearly.

I will assume that you have a multimeter of at least 1,000 ohms per volt rating, as discussed in test instruments a few months ago. Fig 1 shows perhaps the simplest "S"-meter that you can install in either your home-made, bought or converted BC mantel receiver. This is an external meter, in fact your multimeter, which will not be in use otherwise when you are doing any operating. R1-C1 are the already fitted cathode or emitter bias components. Some sets do not have these components and have the cathode or emitter going to ground or common. Disregarding these, it can be seen that a multimeter set to a low voltage range and connected between points A and B will register a reading with no input to the receiver.

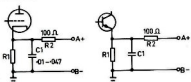


FIG 1

When a signal is received this AGC operated stage will alter its operating conditions and the current drawn will decrease with the valve circuit and a lower voltage will be registered on your multimeter. In the transistor circuit depending on whether the stage is forward or reverse biased will depend whether the current will increase or decrease, and so cause an increase or decrease in the voltage registered across R1. R2 is purely to act as an RF choke so that RF does not get radiated from the multimeter leads. An additional capacitor may be needed across A and B of about 0.47 uF. The value of R1 depends very much on the circuit of the set in use and the actual valve type in use and could, in the case of a valve, be anywhere from 40 ohms to about 1,000 ohms. Transistor values will tend to be lower.

This is normally a backwards reading "S"-meter and has no zeroing facility. It is a cheap system and gives good relative results. One

resistor and two spring terminals would be all that would be needed, besides solder and wire.

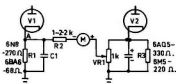


FIG 2

Fig 2 shows a slightly more elegant "S"-meter which is forward reading, has a zero adjust and can be designed so that S9 just comes to the end of the scale. For such a simple circuit this is very good. V1 is the Automatic Gain Controlled stage and V2 is the Audio Output stage. This particular circuit works on what is called the balanced bridge configuration. When there is no incoming signal the slider of VR1 is adjusted until no reading is evident on the 1 mA meter M. At this time point A and B are at the same potential so that in fact there is no voltage across R2 and the meter. Now, if a signal is received, the current drawn by V1 will reduce so that point A will drop in voltage say to one volt. There is now a voltage potential across R2 and the meter. Current will flow and cause the meter to read up the scale. How far it does read up the scale, depends on the value of R2. The value of R2 can be approximately calculated by finding out the minimum voltage present across R1 with the strongest signal you can possibly get. This may in the case of a 6N8 be perhaps 1/2 a volt. In this case then the variation in voltage across R1 is 1 1/2 volts. The 1 mA meter must read full scale then with a voltage difference of 1 1/2 volts between point A and B.

Calculation is as follows, using  $R = E$  divided by  $I$ ,  $E = 1.5$   $I = 0.001$   $R = 1.5$  over  $0.001 = 1.5k$  ohm. Therefore R2 is approximately 1.5k ohm. It could of course be made variable temporarily until the correct value is ascertained. You will of course have to calibrate this meter in some way. Probably the easiest is to divide the scale into ten segments, which it may already be, and use the normal 1 to 10 scale and call ten, S9 plus. Simple, and perhaps not considered accurate, but very few amateur "S"-meters are anywhere near accurate. At least this will be able to tell you if one station is stronger than another. It will tell you if alterations to your aerial make any difference to the reading on a known station.

To suit a 6BA6, R1 will be about 68 ohms and R2 will be about 1k ohm. Other valves will require different values again. The power output valve may not be a 6A05, and may commonly be a 6M5. The 6M5 has a different bias point nominally 7 volts compared to the 6A05 with its 12.5 volts. The position of the slider on VR1 will be different in these two cases. With a little fiddling with the values you will get the meter to read very satisfactorily.

Another simple "S"-meter is shown in Fig 3. This appears to be a circuit that suits transistorised receivers more so than valved receivers. The circuit remains the same for both valves and transistors except that the

capacitors C1, C2 and resistors R1 and R2 will be different in value. The load resistors R1 and R2 for valves will be in total about 1/2 megohm. Cut off bias for most valves designed for AGC operation is in the range from 20 to 50 volts. This means that the current through R1 + R2 will vary from 40uA to 100uA maximum depending on the valves used and their AGC characteristics.

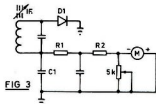


FIG 3

The disadvantage of this circuit is that in the case of valves a sensitive meter movement is needed, a 20,000 ohm per volt multi-meter on its lowest current range can be used here. The detector diode load resistors in the case of transistorised receivers are much lower and may be in the order of 10,000 ohms total. A 1 mA FSD meter may suit in these sets. The rheostat wired in parallel with the meter is used to set full scale deflection with the strongest signal you can receive. There is no zero set as with no signal there is no voltage developed across the resistors and hence no deflection. This is a forward reading "S"-meter. The value of the rheostat for valve circuits will be about 5k ohm and for transistors considerably lower. The active value of the rheostat can be measured with an ohm-meter and it can be replaced with the next lowest value fixed resistor.

## SUMMARY

The preceding three circuits are simple but effective "S"-meters. If you want more of these I can oblige. Some circuits are much more complex than these, with no real advantage for simple receivers.

## ODDS AND ENDS

Next month I hope to be able to give you a list of non-radio items which can be used for amateur radio construction projects. If anyone has ideas on items that can be used please write to me.

Mr Skeney of Kew has kindly donated an old B-C receiver for conversion into a simple 160 or 80 metre phone transmitter. Ron Fisher VK30M constructed a transmitter out of an old B'C set a few years ago, and has volunteered to build another. So in a few months an article describing this conversion can be expected, all being well.

## SEA NET.

"A very highly informal but extremely effective net" is the description for the South East Asia net which meets on or near to 14.320 Mhz at 12.00Z usually with Paddy. 457PB as net control. There were two previous annual conventions of SEA net regulars and interested participants, one in Penang and the second in Bangkok. This year the SEA Net Convention takes place in Singapore on 8th, 9th and 10th November with SARTS as hosts. If you want more details why not write to 9V1QF, Ed Gridi, C-o SARTS, GPO Box 2728, Singapore.

# Try This

with Ron Cooke VK3AFW  
and Bill Rice VK3ABP

One of the most deservedly popular features in the ARRL magazine QST has for many years been the Hints & Kinks page. Some years ago AR also featured a column of hints and kinks but it faded out in 1966. We have now decided to reintroduce it, but in a rather different, expanded form.

We would like to receive from anyone not only constructional clues, brief circuit descriptions and so on, as in QST, but also ideas, whether tried or not. Someone else may be better able than you to tell if your untried idea is practicable, or have more time to find out.

Send all contributions direct to the Technical Editors.

Everything we receive will be considered for publication.

How long we can keep this feature running depends on how much response we get from you, the reader with a bright idea! Until the ideas start coming in we will in the meantime publish a selection of hints and kinks from other publications.

## Precise Zero Beat Device Using LED's

Robert W. Stankus, WIGEY, Director of Engineering Services for Tritel Systems (Lett Inc.) has come up with a little gadget to precisely align crystals to an exact frequency. It enables exact visual alignment of 100 kHz crystals to WWV simply and inexpensively.

See Fig. 1. Two light-emitting diodes connected in parallel, but with opposing polarities make an inexpensive display for indicating zero beat frequency.

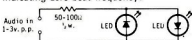


Fig. 1—Device for detecting zero beat to very close tolerances. Depending on the audio response of the receiver beats down to 5 Hz or less can be detected. LED's may be Monsanto MV-5094 or Fairchild FLV-100, or equivalent.

The display can be driven by an a.f. voltage from the receiver's low impedance speaker terminals (usually 8 ohms). A current-limiting resistor is included in the circuit and its value is not critical.

When the input frequency is more than 1 kHz away from the zero beat frequency, both LED's appear to be on all the time. Each one is correctly biased for half a cycle of the input and shut off for the other half. As the input frequency comes within about 20 Hz of zero beat, the LED's will flicker until exact zero beat is reached. Both LED's then go out and will remain out over the width of the zero beat frequency notch which usually is a + or - 5 Hz. While the display is being used, the LED intensity will vary depending on the low frequency response of the receiver being used. (From Page 12, CQ, October 1973.)

## NEON-BULB LAMP DRIVER

The circuit shown in Fig 2 permits operation of a neon bulb from a 12-volt supply at a current drain of approximately 6 mA.

Transistors Q1 and Q2 form a complementary astable multivibrator. The output of this multivibrator is used to drive switching transistor Q3. When Q1 turns on, Q3 also turns on. During the time that Q3 is on, current flows in L1. When Q3 is turned off, a large voltage spike appears across L1 and fires the bulb.

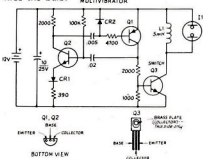


Fig. 2—Schematic diagram of the neon-bulb lamp driver. Capacitances are in  $\mu$ F. Capacitor marked with a polarity is electrolytic; other capacitors are disk ceramic or paper. Resistances are in ohms; k = 1000; resistors are 1/2-watt composition. CR1, CR2—High-speed silicon switching diode (1N914). I1—NE-51H neon bulb. L1—See text. Q1—Pnp silicon, hFE 300-600 (Motorola MPS 6523). Q2—Npn silicon, hFE 300-600 (Motorola MPS 6521). Q3—Npn silicon, VCEO 300 V (Motorola MJE 3401).

In a complementary multivibrator both transistors are off during one part of the cycle, and both transistors are on during the other part of the cycle. A complementary multivibrator, rather than the conventional variety, is used in the neon-bulb lamp driver, because it is off during most of the cycle. This results in less current drain. The circuit will operate satisfactorily at supply voltages of 8 to 16 volts, although the brightness is decreased at the lower operating voltages.

Transistors Q1 and Q2 were selected for their high beta, while Q3 was picked because it has a high breakdown voltage. A ferritecore rf choke was used for L1. — Joe H. Duncan, K4ZL1-2.

(From Page 56, QST May 1970).

## EQUIPMENT FINISH

When new equipment is purchased it is a good idea to give it a coat of automobile wax. This preserves the finish and makes dusting easy. — Louis Berman, K6BW.

(From Page 47, QST February 1969.)

## SIMPLIFIED METER SWITCHING

The writer recently built a simple 6146 CW power amplifier to follow a small transistor transmitter. A 6AQ5 clamper tube was used to protect the amplifier, and a 0-1 milliammeter and suitable shunt and multiplier resistors were employed to indicate either grid or cathode current. However, as shown in Fig 2, a SPST toggle switch, S1, was used to do the meter switching, rather than the usual multiple pole switch. When S1 is closed, M1 and R1 serve as a voltmeter to

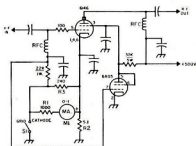


Fig. 2—Only a s.p.s.t. toggle switch is necessary to do the meter switching in this amplifier. Resistances are in ohms; K = 1000; resistors are 1/2 watt unless indicated otherwise. M1—0-1 milliammeter. R1, R2, R3—For test reference. S1—S.p.s.t. toggle switch.

indicate the potential drop across the 5.1-ohm cathode resistor, R2. When S2 is opened, the voltmeter indicates the potential drop across the 240-ohm grid resistor, R3. The full scale cathode and grid current readings are approximately 200 mA and 5 mA respectively. — Wes Hayward, W7Z01

(From page 43, QST July 1968).



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Binders are normally available at \$2; each to contain 12 issues.

It is regretted that due to Customs and Sales Tax problems it is not possible to handle parts and components for VHF Communications projects.

**W.I.A. "MAGPUBS"**

P.O. Box 150, Toorak, Vic., 3142

## "Made in Australia"

A well understood phrase. But how soon might we see "Made in Space." As the "country" of origin so greatly affects trade through Customs Tariff preferences and import/export restrictions will the "made in space" (or "made on Mars") article be classified as the origin of the country owning the SpaceLab? How about a joint SpaceLab venture by several countries? Or will it be necessary to check the passports of the workmen? Or would something be labelled "Made in Ruritania" because the SpaceLab happened to be over that country at completion time of the article?

## Commercial Kinks

with Ron Fisher VK3OM

3 Fairview Ave., Glen Waverley, 3150

This month back to our old friend the FT 200 with some notes on improving the carrier suppression.

Before this however, I have had a letter from Phil 9M2CP regarding the FT101 modifications published in this column two months ago. Phil tells me that in the time since the original publication of these notes, he has made considerable improvements to the front end performance of his 101 and that an article describing this has been forwarded for publication in 'Amateur Radio'.

I have also heard on the grape vine that there is a new model FT101 on the way which is reputed to have a vastly improved front end performance. I believe it will be known as the FT101B. (see insert October 73 AR, Ed).

The August issue of the ZL FT200 Club carried an excellent article on 'Better Carrier Suppression with the 7360', by Brian Pickett ZL28DU.

"When first put on the air, my FT200 had one or two problems, one of which was solved by checking into the Club Net one night. The other was not quite so simple, excessive carrier made it possible to tune and load the finals without tune. The Manual was consulted and the carrier balanced out as per the instructions. Local QSO's showed a carrier strength of S7 and on-the-air adjustment achieved no less than S5. To obtain this level was a nerve-racking task, just breathing on the alignment tool upset everything. Long term stability was also very poor. Obviously the carrier balance control had insufficient resolution and stability, so a Cermet 15 turn professional potentiometer was temporarily substituted and with this, 50 dB suppression was possible.

...Fine, I had exceeded the original specification by 10 dB however the theoretical maximum with the 7360 tube and crystal filter is about 80 dB and I thought I could do better than I had.

### R. F. Balancing

Examination of the circuit shows that the carrier balance control is in reality a carrier amplitude control, relying on exact phasing of the RF across L105 to achieve balance with VR106. The action of VR106 is to equalise the RF voltages at the anodes of the 7360 which, if exactly in phase, should then cancel or balance out. Just how critical the phasing of the RF voltages across L105 are, can be seen from the fact that one degree of phase error will result in a reduction of carrier suppression by about 20 dB. The circuit at present has no manual adjustment for phase errors and this has led me to the obvious conclusions that L105 is factory 'tweaked for the correct phase relationship. Actually L105 is somewhat crude for a circuit requiring component symmetry. It consists of a single winding tuned by a matched pair of 150pF mica capacitors. The output link is taken

from the top end of the coil.

The ideal output tank would probably consist of a bifilar anode winding with the output link taken from the centre. This was considered too drastic a modification, it had to be simple.

The simplest form of RF phase balance uses a trimpot across the output tank, so this was tried. Suppression was excellent — better than 65 dB but the 'Q' of L105 was reduced, and the receiver sensitivity degraded. This method is quite OK for frequencies generally below 2MHz.

Temporary installation of a 30pF differential trimming capacitor across L105 showed promising results, and the coil could be re-peaked with its slug to compensate for the added capacitance. Permanent installation consisted of an 'L' shaped bracket mounted with two 6BA screws on the shield partition between the main print board and the rest of the chassis. The differential capacitor was fitted onto this bracket, directly over the input terminals of L105, and a small brass shield about 1 by 3cm fitted between pins 6 and 7 of the 7360, and the input pins of L105. The shield was earthed solidly at the 7360 and L105. Permanent mounting of the 15 turn trimpot was achieved with the aid of Araldite.

Fitting the case back onto the rig and drilling a hole immediately above the differential capacitor to allow the use of an alignment tool completed the operation. The DC balance trimpot could be reached by a slim trim tool through the ventilation slots.

### Alignment.

If you propose to do this modification, you will need to realign the balanced modulator and L105, and will need suitable alignment tools. Metal of any kind is strictly taboo, although metal tipped tools are OK. A VTMV with RF probe or a VOM with a 'sniffer' and a 68 ohm 1 watt carbon resistor as a dummy load. Initially set the phasing capacitance to half and warm up the rig for 15 to 20 minutes, with the antenna connected. Tune the transmitter for maximum RF output in the normal manner, switch to standby and after disconnecting the antenna, fit the 68 ohm dummy load and RF probe. Switch function to SSB, move lever switch to OPER, and turn the MIC gain fully off. Repeat all transmitter controls for maximum output as indicated on the VTMV. Typically 30 to 100 volts initially. DO THIS QUICKLY. Using a metal tipped tuning tool (the differential capacitors are hard to turn), repeat L105, adjust the phasing capacitor for minimum RF and then the DC amplitude control for minimum, and so on. It may be found that it is necessary to un-balance with the phasing control and rebalance with the DC control VR106. Care and patience is necessary. Eventually a point will be reached where minimum carrier is obtained, the final adjustment is quite critical, requiring only small changes of the phasing control to achieve balance. When completed typically less than 25mV of carrier should be obtained and in my case slightly better than 73dB of suppression was obtained. Long term temperature stability appears to be excellent.

### Points to note.

The alignment must be completed with the

cover on, and L105 repeated. The replacement of VR106 with a 15 turn Cermet trimpot can effect a very worthwhile improvement on its own. Cermet is the name given to the type of resistance element in the trimpot, and is not a brand name. Don't remove L105; placement of components within the can is critical. The capacitor is a Jackson Bros, type 701".

## YRS with Bob Guthberlet

Methodist Manse, Kadina, S.A., 5554

Club Leaders should be aware of the value of publicity for the WIA Youth Radio Club Scheme, and where possible organise a Publicity Officer to make news available to their local press; (a personal interview with the editor of any country Newspaper will be rewarding to clubs that are willing to help themselves). TV and Radio will also give time in their Community Service programmes.

A news cutting sent to me shows the value of liaison between clubs and the community.

The Maitland (N.S.W.) club's theatre was presented to capacity for the presentation of the 1972 I R E E Pennant, Y R C S certificates and prizes won by members.

Guests included: Mayor of Maitland Ald. Noel Unicomb, and Mrs Unicomb, representative of Radio and Electronics Engineers, Mr C. Cowan, District Radio Inspector Mr F. Hinks, Member for Paterson, Mr P. O'Keefe, president of the Junior branch of the Wireless Institute, Mr G. Sutcliffe, representative of NBN Channel 3, Mr R. Proust, secretary of West Lakes Radio, Mr E. Rhonda and Mrs Blackland, Miss Rhonda Edley (Miss Newcastle and Hunter Valley 1970) and club leader of the Gosford Y R C S Radio Club, Mr G. Proctor, and the Officer-in-charge Maitland Police Sub-District, Inspector N. Bowden who addressed the party.

The reader of this may say, "Well, that's fine for Maitland, but how can it help my club?" My answer is, "Have you tried to get publicity? If you haven't, you don't know."

Those who have travelled in the Holy Land will recall the River Jordan with its tributary in the hills of Syria and travelling south reaches the Sea of Galilee, which in turn carries it further south until the river reaches the Dead Sea, and here it stops. The Sea of Galilee receives and gives, and is alive with vegetation and fish; the Dead Sea receives and keeps, and because of this it is dead. To my mind, that is a fair description of some club members. They receive but give nothing. Y R C S is a movement of youth and for its future to be assured there must be a vital giving of time and talents, on the part of all concerned. To say, "that's all the time I can spare" is not good enough.

From the aspect of publicity, which I receive very sparingly from most of the States, it would seem that little movement is taking place, and that points to stagnation. It has been suggested to me in some quarters that to publicize Y R C S is to invite difficulties in that we couldn't find the necessary instructors for an increased club membership; my reply is that by increasing membership we shall create a demand for help, and without that situation the scheme can hardly go ahead. In the business world it is necessary to see the demand and then supply the product. Y R C S has the product and it's a good one. In a recent daily newspaper I read that the 1970's would see greater use of electronic devices and other forms of technology in schools. To this area of activity we must address ourselves and this is the time to be up and doing something about it. Within a few weeks I shall be asking State Supervisors to report Club statistics... there is still time for upgrading the 1973 figures.

### Y R C S OF VICTORIA

Frank Whitton, VK3BAN reports that he has taken over the work of State Supervisor Y R C S of Victoria with effect from 1st October, 1973.

Frank requests that correspondence and enquiries concerning WIA Y R C S of Victoria should be addressed to him at 204 Churchill Avenue, Braybrook, Vic. 3019, telephone number 311-0619, Monday to Friday 0900 - 1700 hours.

All Victorian school and other Y R C S radio clubs should write to him forthwith to initiate various formalities and to confirm both their registrations and their requirements of notes, certificates, etc.



# Contests

with Peter Brown VK4PJ

Federal Contests Manager, G.P.O. Box, 638  
Brisbane, Qld., 4001.

## 1973 REMEMBRANCE DAY CONTEST RESULTS.

**VK5 tightens its hold on the Remembrance Day trophy.**

Yes VK5, with some help from VK8, very successfully carried out their plan to retain the RD trophy for 1973. Tasmania tried hard but the massive score from VK5 was too much to overcome.

VK5 led in highest average of top six Logs and also in participation. Now get out your pencil and paper and do some figuring as to what is required next year. Whatever you decide is necessary to win the trophy will have to include some detailed planning and organisation. This is the year that the VHF fraternity showed their ability with some effect. Note the number of VHF scores; generally the point scores are close to the number of contacts, in VK5, 6 and 7. Apparent to me was the number of HF operators who also scored many single points on VHF, realising that every VHF contact was two points to their state.

**Congratulations to VK5 on a job very well done. Did we make 700 Logs???**

Yes we made the grade with a total of 709 Logs, including SWL's logs. Thanks to those who participated and helped us on the upward path.

You must be pleased that you helped achieve the goal.

There were many missing this year who will have the opportunity to help us achieve next year's goal.

## BUT Most important!!!!!!

I received a record number of comments and a record number commented on the friendly atmosphere of the contest.

The simplest comment, on a scrap of paper, seemed to me the most heartfelt and I give it to you:  
"A very lovely contest. God bless you all"

We can be very proud of our contest... I help with it next year. Many Logs had the other contacts name written in. If you have time to exchange names it makes a more friendly contest.

## Look out here are some brickbats.

Over 700 Logs (yes I asked for them) about 3000 sheets of paper, a September deadline to get results in November Amateur Radio, and I get:

1. A high percentage of Logs without a front page.
2. A high percentage of Logs without any details anywhere.
3. About seven Logs without any scoring.

My heartfelt thanks to the VK5 gentleman who prepared so many front sheets and made my job so much easier.

If you expected me to correct 1, 2, 3... you were right... I was determined that we make a success of the contest.

Again my compliments to so many, generally high scorers, who typed and printed copy book logs.

## DETAILS OF DIVISIONAL SCORES AND PLACINGS.

Divisional Log Licences Participation Top 6 Points Score per cent age average

VK5	9	154	798	19.3	1471	47096	10559
VK7	0	67	227	29.5	1615	21582	7995
VK4	9	27	839	15.1	1301	35994	6749
VK1	9	2	148	21.62	1415	42987	4298
VK6	8	96	516	16.6	972	19764	4266
VK3	9	92	2012	4.5	870	22617	1904

In detailed scores the first figures are the points score and the second contacts made.

Divisional sectional leaders logs are subject to further checks.

Logs from VK5UF, 30 points and 8 contacts, and VK8ZC, 1323 points and 431 contacts were not included in the Divisional results but do not affect them markedly.

## STATE SCORES

### VK1

Phone	MP	1218	567	JL	285	127	HR	56	34
GR	1068	428	RA	206	114	ZOC	30	30	30
MS	657	269	LF	129	52	ML	11	11	11
JC	544	201	ACA	118	71	ZAR	8	8	8
YR	298	157	MF	60	25	VK	6	6	6

CW	VP	262	72	Open	1074	434
LO	148	74	ADP	903	404	
DC	116	68				

VK2	BNS	1700	581	BML	216	83	LU	72	21	IC	1604	611	PJ	196	63	FE	51	15
Phone	ASD	1579	621	BHD	193	58	AM	89	19	DO	678	306	ZP	114	32	HW	47	10
	XT	1448	505	BKG	193	60	ZCT	69	69	IE	778	292	AF	111	39	NG	38	12
	DM	1185	418	VU	173	62	ZSG	65	65	OE	673	211	PU	106	30	BG	35	12
	DWF	1139	407	AJH	169	43	AY	60	21	FU	577	202	JP	103	47	LE	42	44
	AGF	845	274	CM	168	41	BJK	60	21	AK	550	190	ZAP	102	104	ZML	28	28
	BKM	807	279	MR	167	41	OH	58	14	PS	549	201	UJ	101	101	GT	29	22
	BKN	738	299	WD	160	52	CW	58	15	TC	509	169	LB	93	39	ZNH	28	28
	AG	775	287	AGS	160	65	DC	57	28	JS	465	118	RL	93	36	HZ	22	9
	BON	674	286	UV	145	50	CA	58	35	PL	417	150	NP	82	35	EH	22	11
	AJY	637	235	AYN	145	51	AWX	49	17	NQ	403	121	VS	80	23	YO	18	6
	ZA	567	190	JS	136	32	AHH	48	21	GD	388	125	DF	83	23	ZHK	21	21
	APD	551	172	BYT	128	69	AQK	42	17	ZB	384	127	OJ	81	31	ZFA	18	18
	AWN	437	157	SG	120	23	ZDR	42	17	IZ	347	106	UT	72	28	ST	18	6
	EJ	403	160	WT	118	38	XD	38	12	VV	313	109	CC	66	25	ZEA	16	6
	VW	398	102	RU	114	23	AEC	37	18	UP	313	119	RC	66	25	ZEA	16	6
	BLB	372	160	SW	104	27	AHA	36	11	DZ	299	101	ZZ	66	20	B0	16	6
	BOB	352	127	PF	113	31	ZL	36	9	QA	267	98	OO	65	36	ZTL	15	15
	BDS	345	131	BUC	108	28	BGG	35	9	FX	275	75	AQ	57	57	OT	13	6
	AJL	321	103	ASJ	103	33	ZVN	35	15	LN	258	84	JEZ	57	57	OT	13	6
	AUX	275	89	GV	101	29	ZVY	27	27	XG	256	97	HJ	55	25	ZDG	9	9
	ANQ	275	74	AGZ	99	30	CAL	25	20	GI	245	79	RO	55	9	U	9	9
	BLX	274	118	GO	99	35	BVS	23	20	214	68	OR	55	22	22	OS	6	6
	BMX	271	101	BGX	97	25	AVR	17	17	OX	226	66	DV	50	22	OS	6	6
	ACD	255	88	AF	94	26	ZMO	15	15									
	BBH	246	80	AKY	91	80	AVR	15	15									
	CS	221	62	BHS	80	19	ZWL	7	6	CW								
	LW	219	54	GT	77	30	AQ	6	6	XW	703	133	SO	150	60	JX	47	2
	AXJ	216	96	CU	76	22				KX	428	160	RE	106	47	WL	32	8
										PB	330	66	HB	65	30	CH	32	8
										MY	238	95	FB	56	21	GH	15	8

Open	BO	1357	488	BZX	443	164	RJ	243	72	RF	1275	453	UA	663	210	BZ	53	18
	CAK	1070	340	PN	368	115	BPR	212	72	HE	1118	331	PM	342	101	CA	50	25
	BS	791	293	HO	322	123	AFV	169	70	UX	1099	341	RT	273	102	VA	47	18
	BML	692	250	PA	284	93	HZ	108	25	UH	248	407	LA	269	70	NB	43	19
	BJJ	682	238	AAC	260	100	AJO	101	31	LT	805	194	PS	206	63	FJ	16	13
	AHM	609	203							XY	680	194	FS	139	53			

CW	CR	556	211	AV	218	92	SI	58	20	Receiving	W. Whitew	1245	V. Lenehan	505-192
	GR	511	197	20	202	34	HL	58	53		H. Grau	771	K. Cunningham	436-167
	BF	437	173	YJ	145	61	CT	52	20		A. Downey	506-198	A. Macpherson	189-69
	HC	423	143	BBB	136	63	IV	51	24					
	QW	334	118	BOQ	97	37	AWI	43	18					
	UN	291	103	JM	93	47	AXK	39	12					
	BNA	285	105	JO	88	40	AND	16	6					
	BHO	263	104	VM	79	27								

Receiving	J. Varnelle	1016	227	R. Sulcs	656				
	J. Hilliard	697		S. Dwight	610				

VK3	881	09/	S. Dwight	610				
AYF	Phone							
AYF	805	326	HT	240	108	AFW	121	51
ADL	746	308	HR	238	120	WQ	85	26
BOW	200	305	YK	232	123	AFV	169	70
BDL	728	364	LU	218	78	UJ	76	16
ZPS	641	290	BJB	206	68	YBS	67	67
AFS	551	220	AKC	184	118	NZ	62	32
AKV	650	262	AUG	176	107	JO	56	39
EF	476	222	ZJ	174	84	YK	56	39
RY	475	210	ASE	171	69	AFI	50	44
YQ	475	175	HD	168	55	GS	48	27
ADL	429	148	AS	150	62	YF	47	22
KY	475	145	VAP	146	146	ZBB	44	27
SM	338	151	WM	143	53	ZRG	39	40
BCT	330	155	AGJ	140	118	ZGY	25	25
ALK	324	181	DY	132	54	KS	22	7
ANP	314	120	ASV	130	57	YFL	16	16
HE	288	120	AAM	128	72	RN	12	10
BFN	260	122	EG	127	37	ZQC	12	10
						ZTA	7	7

CW	ZTA										7	7
OP	533	247	CM	184	85	NK	85	47				
XB	527	234	ZO	142	72	ZN	80	24				
YJ	279	122	KX	132	61	AXQ	63	20				
JK	242	110	RJ	122	58	BRC	58	24				
DG	230	117	ABR	117	50	XV	32	17				
ACV	230	108	ARV	91	40	OF	7	5				
ARK	197	101										



<b>Open</b>			
EN	1144 422 QP	412 151 RK	157 58
MM	772 237 OT	367 110 KJ	136 60
RG	543 207 IF	138 126 QR	75 37
PH	508 164 ZF	196 62 RC	124 62
FM	506 202		

<b>Receiving</b>			
R. Whitford	1664 627 D. Minchen	73 170	
M. Dibden	640 213 R. Edmeades	62 131	
C. Collins	367 151 T. Hannaford	10 10	
C. Fordham	198 84		

<b>VK6 Phone</b>			
KG	1364 546 AN	209 82 TP	66 49
DA	918 415 ZHR	209 209 GR	64 29
AB	876 350 MO	204 64 VF	63 63
KY	766 335 DZ	178 84 WH	61 21
VP	724 223 JJD	174 174 BO	57 19
ZZ	664 127 ZGZ	166 167 NA	57 19
JR	596 227 JQ	181 61 MB	57 26
VW	411 155 HE	150 51 RD	40 34
RL	395 153 ZKO	128 128 JA	34 16
NM	328 124 ZIW	128 128 LF	33 33
BY	310 116 IC	121 56 CD	31 13
RY	308 162 VK	107 38 PD	31 31
HU	273 192 KC	106 33 ZFF	31 31
ZDG	264 264 ZHJ	103 106 CH	30 9
OR	260 108 OW	99 42 HC	25 16
WL	258 101 ZKW	93 93 WD	24 19
NE	257 168 VI	89 89 PX	20 13
DD	256 124 AWI	88 88 KU	16 7
XY	251 94 XY	86 44 LT	12 7
WU	242 55 XH	81 44 ZXY	9 9
SH	233 172 XV	76 35 ZK	7 6
ZHA	233 233 ML	75 26 FN	5 5
ZDA	230 232 GR	73 39	
TA	223 89 FP	67 31	

<b>CW</b>			
WT	498 194 RS	285 177 GA	22 10
CT	492 193 CF	90 36	
BC	488 190 WA	33 15	

<b>Open</b>			
MA	1185 517 QJ	325 160 DW	42 14
RJ	824 274 HK	342 101 LE	21 10
EB	556 222 CR	96 40	
ZE	370 164 DW	96 40	

<b>Receiving</b>			
T. McGrath	1107 403 G. Allen	171	
R. Edwards	540 335 D. Hides	138 47	
C. White	456 97		

<b>VK7 Phone</b>			
AZ	1521 631 ZE	222 232 ZLH	71 71
JV	1404 626 EM	232 105 ZWX	59 59
MS	976 426 ZBY	205 205 AB	48 30
MX	730 316 ZSF	201 202 RX	46 10
NR	693 408 SR	231 107 HE	45 45
LH	552 339 EB	195 84 CT	43 20
BR	475 284 ZGG	172 172 AX	25 25
KH	441 157 ZGJ	154 154 TT	23 23
ZIF	400 402 PF	163 143 AJ	20 8
OH	381 217 JQ	143 69 ZJG	18 18
GW	370 106 ZAQ	143 143 JO	14 14
KP	320 181 ZLD	139 139 JD	10 10
KS	280 240 ZMF	138 139 ZL	10 10
FJ	279 177 BK	102 102 ZBE	9 9
MB	258 125 AW	119 104 ZK	9 9
WH	253 148 ZFR	117 117 ZX	8 8
L.S.	263 150 HK	79 79	
BM	236 107 ZJR	75 75	

<b>CW</b>			
CH	408 181 KJ	1533 691 R.J. Everett	975
GV	226 100 SS	1223 612	
RY	255 119 AL	723 214	
BJ	110 41 RH	544 308	
CIC	60 25 LP	216 120	
JB	25 15 LZ	143 54	
YL	25 19 KS	27 27	

<b>VK8 Phone</b>			
CM	1085 410 JS	155 72 KK	1895 738
ZB	608 235 AZ	87 30 ZZ	519 210
DI	527 207	OU	440 146
KP	388 157 CW		
<b>VK9 Phone</b>			
GA	943 308 FV	411 131 EJ	656 233
RY	903 284 GR	212 83	
ED	874 223 KA	141 43	
FM	655 196		

<b>VKO Open</b>			
WW	3032 534		

<b>New Zealand Phone</b>			
ZL2AH	768 300	CW	597 157
ZL3ABC	692 198	ZL4CP	
ZH2AUP	593 305		
ZL4CP	512 112		
ZL140	439 223		
ZL2HE	257 123		
ZL4CA	203 30		

<b>Open</b>			
ZL2ACP	590 152		
ZL1AAM	223 108		
ZL10B	275 101		
ZL1SV	174 107		

### ROSS HULL MEMORIAL VHF-UHF CONTEST 1973-1974

Now that you VHF chaps have shown that you can really get into a contest what about making the Ross Hull a smashing success??? All you do is get on the air, make a few contacts and send in a Log. Your participation will make the contest a success.

The target for the coming contest is 200 Logs... the number you gave numbers last year, but only 40 sent in Logs.

You could exceed 200 Logs with the greatest of ease by just trying. Come on VKs 2, 3, 4, get going.

### JOHN MOYLE MEMORIAL NATIONAL FIELD DAY.

Now is the time to obtain and/or try out your "putt putt" for the second week-end in February.

### CONTEST CALENDAR

November 3rd and 4th R S G B 7 MHz phone.  
November 11th Czechoslovakian Contest.  
November 24, 25th CQ WW DX CW contest.  
December 7th Ross Hull Memorial VHF-UHF Contest.  
December 22nd, 23rd Hungarian Contest.  
February 9th, 19th John Moyle Memorial National Field Day.  
February 24th Central Coast Amateur Radio Club Field Day.

### Some CQ Contest results

VK2BKM	946368	1300	90	158
VK2GW	277344	667	61	83
VK3XW	653020	1078	79	127
VK3J	54416	246	38	38
VK3APH	78660	308	30	60
VK3RAJ	576	20	9	7
VK4AK	1247	17	14	15
VK6AJ	36984	189	28	41
VK6CT	9956	94	16	22
VK6HD	54	4	3	3

Multi single operation  
VK4VU 621712 1094 72 124

### CZECHOSLOVAKIAN CONTEST

November 11th 0000 GMT Sunday to 2400 GMT Sunday 11th

Participating stations work stations of other countries. Contacts of same country multiplier only... no points.

All bands. No cross bands or mode.

Exchange Phone: 4 numbers, RS report plus ITU zone number.

CW: 5 numbers, RST plus ITU zone number

Scoring: One contact per band per station. One point per complete contact. 3 points per Czech station contact.

Multipliers: The sum of ITU Zones from all bands.

Categories:  
A. Single on all bands.  
B. Single on one band.  
C. Multi on all bands.

Any assistance makes the station a multi op.

Separate Log for each band.

A Column for points and also ITU zone (first station only).

Usual front page with details, including declaration.

An award for 100 "IK" station contacts.

Logs to The Central Radio Club.

Post Office Box 69, Prague 1, Czechoslovakia.

## Afterthoughts

The VK-ZL-Oceania DX Contest 1972 Results printed on page 20 of August 1973 A R accidentally omitted the following two scores under VK-Phone

Call	80 40 20 15 10
2ABC	-- 5235 -- 5235
2ASI	-- 4296 -- 4296

Apologies to the participants concerned.

## Ionospheric Predictions

with Bruce Bathols, VK3ASE

The Predictions listed below are obtained from information supplied by the Ionospheric Prediction Service Division of the Commonwealth Bureau of Meteorology.

Times stated are G.M.T.

28MHz  
VK3 to (possible 40 per cent)

30MHz  
VK3 to (possible 40 per cent)

30MHz  
VK3 to (possible 40 per cent)

30MHz  
VK3 to (possible 40 per cent)

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30MHz  
VK3 to (possible 40 per cent)

30MHz  
VK3 to (possible 40 per cent)

# WFF WFF

## an expanding world

with Eric Jamieson VK5LP

Forreston, S.A., 5253  
Times: GMT

### AMATEUR BAND BEACONS

VKO 52.180 VKOWI Macquarie Island  
VKO 53.100 VKOMA Mawson  
VKO 53.200 VKOWI Casey  
VK2 52.450 VKZVI Dural  
VK3 144.700 VK3RTG Vermont  
VK4 52.600 VK4WI-2 Townsville  
VK4 144.400 VK4WI-1 Mt. Mowbrall  
VK5 53.000 VK5VF Mt. Lofy  
VK5 144.800 VK5VF Mt. Lofy  
VK5 52.006 VK8VF [VK8RTV] Bickley  
VK6 52.900 VK6RTT Carnarvon  
VK6 144.500 VK6RTV Albany  
VK6 145.000 VK8VF [VK6RTV] Bickley  
VK7 144.900 VK7RTX Devonport  
VK8 52.200 VK8VF Darwin  
ZL1 145.100 ZL1VHF Auckland  
ZL2 145.200 ZL2VHF Wellington  
ZL3 145.250 ZL3VHF Palmerston North  
ZL4 145.300 ZL4VHF Christchurch  
ZL4 145.400 ZL4VHF Dunedin  
JA 52.500 JA11GJ Japan  
HL 50.100 HL9WI South Korea  
ZD8 52.010 ZD8VHF Port Phillip  
XK6 50.110 XK6HK Marshall Islands.

■ denotes an added listing this month.

In addition to the above beacons, for those new to the bands during DX seasons, the various television stations provide high level signals from time to time.

Those of greatest interest are as follows:

50.750 Channel 1 from New Zealand  
51.740 Channel 0 from Wagga  
51.750 Channel 0 from Brisbane  
51.760 Channel 0 from Melbourne  
43.750 Channel 5A from Wollongong

It should be noted however, that the power of these stations is 100 Kw ERP and need to be heard very strongly as a rule before amateur station signals are workable. The DX season separation between the Australian stations allows for identification of the particular transmitter. Separation frequencies for New Zealand TV Stations were published last month.

### ROSS HILL MEMORIAL CONTEST

The Federal Contest Manager Peter VK4PJ writes seeking help with the promotion of this year's Ross Hill Memorial Contest. Peter mentions that records indicate that more than 200 V H F operators took part in last year's contest, yet less than 40 submitted Logs! Well, that is not a very good indicator for the overall success of the contest as it is really worth running a contest on a national basis for less than 100 entrants? Isn't it possible for the V H F fraternity to give a similar display of support to that shown in the Remembrance Day Contest? Perhaps most of us are tired after the hot weather of the summer to be bothered with writing up a Log. Is the daylight saving worrying you, with mother on your back to get on with the gardening during the those long hours after you finish work at 5 p.m.? Yes, I know I did not submit a Log myself last year, the first time for a long time that I had not, but then it is a bit difficult to send in a Log if you did not work any at all due to a changeover to DST which was not completed in time. That is my excuse. What was yours?

OK, That was last year. What about this year? Can we try at least 200 Logs submitted, even 100 would be a vast improvement but let us try for 200. The best way to get your Log done is to start on it as soon as the contest is over; do not put everything aside for a week or two just to have a well earned rest, otherwise most go on resting and the Log is never submitted. Anyway, all joking aside, let us be serious about it, and see what we can do to make the Ross Hill Memorial Contest one which perhaps for several reasons need only be second in the V H F Contest.

A final point on DX in general. This year again will see a further increase in the number of S S B operators on 8 and 2 metres, and if you are able to run fairly high power you will find the bands open to you more than previously; certainly S S B stations are workable longer than AM stations. However, there is a

place for AM on the bands, 6 metres in particular, but with many of the usual operators now set up for S S B it rests now with the AM operator to make sure he has a clean stable signal, preferably VFO controlled. If you have a drifting signal with FM on it, your days of being received by the S S B boys are very severely limited. Due to their narrow pass-band receivers, one or two attempts is all you will get, after that, on your own! Finally, for the S S B boys, watch how you show into the mike; if you are using a 40W VEP on a poorly set-up transverter, you can finish up being 20 to 30 kHz wide, and cause considerably more interference than you did when having similar signals (noise-wise) on AM.

### EME SIGNALS

Word arrives via Lyle VK2ALU from the Illawarra Branch of the W I A in NSW, that an EME test was made on 2-9-73 with ZK2UHF and W6FZJ. The signals received from ZK2UHF were much better than ever before and reflect the additional gain obtained by Al from his 28 foot dish over that from his previous 20 foot diameter dish. Here I take up Lyle's story:

*We copied solid signals for several of his transmissions, peaking up to 768 or more above noise level. At the same time we were receiving signals possibly louder than our own echoes, due to his transmitted power being much greater than ours. However, he was not copying us as fast as we were copying him, probably due to our lower power. The signals from W6FZJ were detected but not good enough copy to make them readable.*

### A.C.T. DIVISION OF W I A.

A copy of Volume 1 No. 1, of *Forward Bias* has been received from Canberra from that newly created division, and is full of news. Hope in time it will feature a VHF column as surely there must be some VHF operators still left in Canberra! I noted with interest the mention of two new amateurs to the ranks in Canberra, Peter VK1LO and John VK1KJ. Both were members of the YMCA Radio Club. Chris passed his exams at 14½ and was able to get on the air on his 15th birthday. He operates mainly CW on HF. The note at the bottom is the interesting part: *VK1RD, VK1ZDA and VK1DC are brothers. That's quite an effort for a family; wonder if there are any others around Australia?*

### FROM GEELONG

The Geelong Amateur Radio and TV Club Newsletter for September duly arrived and I was rather taken with a cleverly written piece of nonsense contained therein. This column does not divert from the straight and narrow path of VHF but I think the Editor will grant me space this time. I quote:-

*WANTED. A reward is offered for information leading to the arrest of Eddy Current, charged with the induction of an 18-year-old coil named Henry, found in a pool, half choked and robbed of valuable volts.*

*This unrectified criminal armed with a ferrite rod, escaped from Western Primary Cell, where he had been clapped in iron since Faraday. With an erg to be free, his escape was carefully planned in three phases. First, he fused the electrolytes, then climbed through the acid and despite the presence of his wanderers who reactance was too slow. Finally, he went to earth in a magnetic field.*

*What seems most likely is that he stole an A.C. motor. This is of low capacity and he is expected to try to change it to a category, and return by a short circuit to ohm. He may offer resistance and is a potential killer. A.C. Maynes-Humun. Sheriff.*

### ATV COUNTRY FIRST

Two South Australian Amateurs on 17th September established what is believed to be an Australian first with the successful completion of a two-way duplex contact using colour ATV. Maitland VK5AO operated on 576MHz and Ray VK5ZFZ used 441MHz, with signal strength on 576MHz being 5 by 8 and better than S9 on 441MHz. The differences are mainly attributed to the rather poor path over which the experiment was conducted, and the higher proportionate losses to be expected at 576, eg. equipment inefficiencies rise higher feedline losses etc. Both stations use a QO60-40 in the final, grid modulated. Ray used a log periodic antenna, and Maitland a 16 element collinear. Corner reflectors are being constructed by Ian VK5ZJS for future experiments.

The equipment at home base and built to commercial standards, except Ray's camera which is made by Sony. First experiments towards the final end contact were made about 7th September, and ten days later the contact was made, and has since been followed by several other similar contacts. Considerable duplication of black and white had been completed prior to this.

I am sure we all join in congratulating these two boys

for their efforts with colour ATV and hope that news of their success may stimulate interest in other people to try it as well.

### SIX METRES DX

A letter has just come to hand from Bruce VK8AZ in Darwin stating that the 6 metre band opened to JA and KG6 on the evening of 1st September. Bruce managed to work KG6RA, JA2, JA3, JA4 and JA5 during the period from 2055 to 2230 EST. Bruce VK8BD was also on and copying their signals even better. Bruce also mentions he had been listening on and off since February with no success until the 27th. Colin VK8DH has organised a 6 metre net on Thursdays nights from 2000 onwards to try and encourage some 6 metre activity. The JA's commented on the fact that the Darwin beacon VK8VF is heard regularly at good strength. Bruce uses an FTDX400, FTV650 and a 4 element beam. Thanks for the letter, and would be pleased to hear from the Darwin area again soon.

### GENERAL NOTES

Garry VK5KZ advises of a message from Bob VK6BE that the Mt. Adelaide (W.A.) beacon on 135.5 MHz is operational again, being a little earlier than usual. This beacon is a useful indicator of band conditions between the UK and VK5 in particular on 144 MHz.

A report to hand of the possibility of a 144 MHz beacon in Darwin this season. Maybe some further news from that area may trickle through to me eventually with information on this and the proposed operations and additions to the existing 6 metre beacon in Darwin.

That seems to be all the news for this month, so for the time being think about this: 'The trouble with the white-price policy is that everybody is trying to climb aboard and nobody wants to get off.' Until next month. The Voice in the Hills.

# PROJECT AUSTRALIS

with David Hull VK3ZDH, Chairman, Project Australis.

In early September the first sign of trouble with the battery on Oscar 6 showed in several very low battery counts on Channel 3A of the telemetry. The lowest recorded reading was 330 and operation at this level for any length of time would have seriously endangered the package. Whilst even this low level of battery counts did not signal a crisis of efficiency, due to the level of voltage still being above the voltage regulators, the satellite was held off until the battery recovered. The fault was thought to be a faulty battery cell failing to charge.

In order to extend the life of Oscar 6 to the maximum obtainable it was decided to restrict the operation of the package to night orbits only. This means in future the satellite will only be available on Monday, Thursday and Saturday nights. Operation on this schedule has already improved the battery situation and we have confidence that the present operations of the package will continue at least for the designed life of AO6. It could be pointed out that each orbit over Australia at night comes out of the daylight and thus the battery is at a charged state when used by VK amateurs. This we can expect that if conditions are maintained, AO6 operation over this continent will be maintained to the last.

The present estimated date for the launch of Oscar 1 F-1, 1974, is August. This date is not significant. The Australian contribution to Oscar 7, the T T V telemetry encoder, left Melbourne in early August and all things being well should fly in AO7.

The new and very welcome contact with Oscar has been the fine signal of 9M2Z from the Kuala Lumpur net on CW. Reports also of HS4AGN Thailand and other Asian mainlanders have been noted. A complete rundown on Oscar 6 and its capabilities will be published in early in the new year in time for construction and preparation of equipment for this satellite.

# around the trade

Dick Smith Electronics Pty. Ltd. has arranged to circulate their 64 page manual, catalogue and directory of the Electronics Industry as part of the October issue of Electronics Australia. This was included in their advertisement in A.R. in October.

Sungvare Pty. A.R. has issued a press release about this circulation which numbers 45,000. A further 10,000 copies of the catalogue will be distributed by state. This is the first time such an ambitious insert has been included in Electronics publishing, and as Selwyn Savers, the Advertising Manager of Sungvare's 'Electronics Australia' comments 'While it is obviously an astute piece of marketing by me, I am sure this campaign will produce a very enormous value and interest to all readers.'

# 20 Years Ago

with Ron Fisher VK3OM

November 1963

Twenty years ago this month, the Wireless Institute was successful in negotiating with the Post Office for the copyrights to publish the Australian Call Sign Book. The initial copyright was for a period of five years and it was expected that the first edition would be on sale during March of the following year. The Call Book has been a regular publication of the Institute ever since. Before this, a list of Amateur Stations was published in the Radio and Hobbies produced "Short Wave Handbook", and prior to this the PMG produced their own amateur call sign book.

November 1963 AR presented an interesting array of technical articles. As mentioned last month multi-band tuners were very much to the fore about this time. The Multi-Band Antenna Coupler was the subject of an article reprinted from QST. Working on the principle of the multi-band tuner, all bands from 30 to 10 could be covered with two coils and no switching.

C. J. Cook VK4CC showed us how to make a "Standing Wave Indicator for 2 shillings (inc tax)". He used two diode lamps, one at either 300 ohm feeder or to coax cable. With some experience this system worked well, and even today could well be used in an emergency.

E. Cornelius VK5EC continued his "Amateur Television" series giving circuitry and details of the video mixer and video receiver.

"Western Australia Again". What else but the Remembrance Day contest. Top scores in that State were: VK6FL VK7KB3ATN VK2ZC VK5MS and VK4RT. And of those VK5MS made the top Australian grade of 790 points. Although not counted in any of the State scores VK1AF topped in a sizzling 1086 points.

On the equipment front, R. H. Cunningham Pty. Ltd. announced the arrival of the new Eddystone 840 Communications Receiver. A seven tube job with one RF stage and one IF stage at 455kHz. The price £103 6-2d. It covered from 620 metres to 30.6 MHz in four bands, with the usual smooth running Eddystone dial.

## Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

The Editor A.R.

Dear Sir,

I have just got around to reading Bill Currie's amusing article in the July issue of AR entitled "How to Succeed in Electronics". There is much in this I solemnly agree with for I too have had many failures with "modern" solid state devices — much more than I ever had over my 40 years with valves. I am learning the sorrowful lessons, and now "tuning in" as many uses and protective devices as I can muster before switching on the power to a newly constituted solid state device.

A transfer fan, Cyril Buckingham, VK3OV keeps telling me that "transistors are beautiful". Yes, like having a ravishing blonde for a girl friend. You have to tie her up hand and foot to stop her from being knocked off.

I quote the case of Lew Harding, VK3LX, who in the late 30's would be found in his Footscray shack, pounding away with "... a thousand or so volts on the anode ... of his 210 final. If his sending was slow enough you could read his code by watching the length of the glow on the 210 anode; yet this valve lasted years (with an occasional "coking" of the filament). No, they don't make them as rugged these days!

Yours etc.,

W. Russell, VK3ZUP

The Editor, AR.

Dear Sir,

I wish to draw your attention to the extraordinary letter I found in this week's Camberwell "Free Press" (28-9-73), which I have enclosed.

(The Press Cutting referred to the usual "opinions that best many residents". The neighbours had of course objected and there is the usual heart-throb about an 85 year-old mum and her comforting TV. — Ed.)

Although the Camberwell Council is apparently trying to be fair, by enquiring among neighbours as to whether there may be any objections to the erection of a tower, one is left with the feeling that equal representation is not allowed — is the person erecting the tower able to seek proof of the complaints?

Taking the objections one by one; on what grounds are towers unsuitable in small suburban blocks? Why should adjoining properties be devalued? Because the tower is unsightly? Show me a television antenna which is aesthetically pleasing. Because the tower is unsafe? Hardly: the tower is replacing an existing one which does not meet Council specifications. To state that a tower of this sort will interfere with television reception is ridiculous. Claims like this only serve to underline the claimant's ignorance of what they are talking about. According to one claimant, the area has poor television reception. But how is the tower going to interfere with television reception? Ghosting is an explanation I find hard to believe; maybe we act as a VHF signal-sucker. Or must the Amateur Radio fraternity continue to be the scapegoat because television receivers have an aversion to strong signals in the immediate (frequency) vicinity? Or even not immediate? Or even not harmonically related? Focey.

The daughter of the 88 year old lady has presented a claim which defies logic to unravel it. What does she mean?

Let's look at some of the arguments against the non-erection of a tower:

1 The amateur concerned — I don't know who he is; all I know is that he and I have a common interest — is just as entitled to pursue his hobby as is the 85 year old lady.

2 If the amateur already has a tower up, how can the claims against the erection of a new tower possibly be justified? On the assumption that there must already have been a Council permit obtained, were the neighbours queried as to objections at the time the permit was sought? No mention is made of this. I am led to wonder how he was able to erect his tower in the face of such opposition.

3 Is the tower to be in use 24 hours a day?

I am also upset at the biased opinion expressed by the reporter: "... there is little control over the number of licences ...". Amateur Radio is a "fatal epidemic disease" (Oxford Pocket Dictionary)? Even the heading is a downright untruth. ("Hear Towers Merit TV Reception").

Finally, I am very glad I don't have the above complainants as neighbours. What a sad lot of people they must be.

Yours faithfully,  
John Lilley (VK3AZJ).

## Magazine Subscriptions

Direct from Publishers

LATEST PRICES (still under review until exchange rates stabilise)

• "QST"	\$8.20
• "RADIO COMM."	\$8.80
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(\$13.50 for 3 years)	
• "73"	\$6.50
(\$11 for 2 years, \$15 for 3 years)	
• "HAM RADIO"	\$5.50
(\$11.50 for 3 years)	
• "VHF COMM."	
Surface Mail	\$4.00
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PROJECT AUSTRALIS GREAT CIRCLE MAP is still available at 60 cents plus 25 cents postage.

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## Awards Column

with BRIAN AUSTIN VK5CA  
P.O. Box 7A, Crafers, SA, 5152.

The following additional stations have qualified for Awards, and certificates have been issued —

W A V K A Award

Certificate	Callsign		Callsign
571	UA4HC	577	JA2DNA
572	UK0QAE	578	ZL2IK
573	UL7NW	579	G2DF
574	UW0IF	580	JA1DQT
575	9H4G	581	JA3KWJ
576	JA4FUQ	582	G3TLV

W I A 52 MHz W A S Award

Certificate No.

108	K1JB
109	VK4GM ex 4ZGA Add countries 3
D X C C	

New member:

Call VK8KP Certificate No. 141 107-107

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QUAD KIT: \$90.00. Freight forward, consisting of:—Hub; 12' solid F/G. Spreaders; Aluminium Extenders, Ferrules, Adaptors; 350' 0.064 Heavy Duty Copper wire; Nylon line and Insulators. Araidite (10 oz.) \$4.00 if required.

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6' solid F/G blanks. 1/2"-3/4" \$3.00

Solid brass butt fitting, 1/2" whit. or 3/8" UNF thread. \$2.00

Brass tip chuck 50c

Long items must be sent freight fwd. on road or rail. Copies of March 1970 "AR" article available by sending \$ A E.

S. T. CLARK

P.O. BOX 45, ROSANNA

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## Magazine Index

With Syd Clark, VK3ABC

### BREAK-IN August 1973

Marconi, The Inventor of Radio Communication; The "Climax" Repeater.

### RADIO ZS June 1973

Technical Description of the NETSET.

### CG August 1973

A General Coverage Solid State Communications Receiver with Direct Digital Frequency Readout; A Deluxe Screen Modulator for Beginners; Further notes on the SS Mk4 SSB Monitor; An Electronic Timer for less than \$5.00; Using the Surplus R-390 Receiver for SSB; FM Repeaters — A Paradox of Problems.

### CG September 1973

An Integrated Circuit Morse Code Keyboard; OSCAR-Mobiling; CG Keying: The Midsa Model 6354 Mini-Multimeter; A VFO Reversing Switch for ORP Operation; 1972 CG W-W. D. X. Contest Results

### HAM Radio June 1973

Digital RTTY Autostart; A Complete Audio Module; FM Repeater Installation; Regulated a.c. Power Supply for Mobile Equipment; Microprocessor Communications Receiver; High Performance Broadband IC Amplifiers; Using the Heath SB-650 Frequency Display with Other Receivers; Logic Oscillator for Multi-Channel Crystal Control on VHF FM.

### 73 Magazine July 1973

Tunable Reception for 2 Metre FM; A Basic Amateur TV System; Maximum Performance for small Yagis; An Accurate Frequency Standard; A Digital Identification Unit; Mobile — and DXing too; 450 MHz Power Divider; An Experimental Comparison of CW Audio Filters; "Concerning a System to Achieve 85 dB Gain on a 2M Antenna"; Compromise Multiband Antennas; Spinoffs from NASA to the Radio Amateur; Grid Dip Tuning the Quad; FCC Rules and Regulations Part 97 (II).

For some time now I have hoped that space would become available to carry reviews of some of the 'lesser known' magazines which come to the WIA without digressing into the 'foreign' publications which require translation.

This month, as material is somewhat less than usual I propose to say a word or two about *Mobile News* published by the Amateur Radio Mobile Society, three issues of which are to hand, namely September and October 1972 and June 1973. This journal publishes technical articles and tips of interest to 'Mobiles' HF or VHF, A.M. or F.M. The subscription rate is low and information may be obtained from R. E. Snell, VK3-BGG, OTHR. The other journal is an old friend of ours from VK7, *The Australian EEB*. The last issue I have to hand is dated December 1972 and since Leo VK7RG did not publish his very interesting magazine for some months I am not surprised that he has a back log to catch up. Enquiries should be made by SAE to P.O. Box 177, Sandy Bay, Tasmania, 7005, Australia.

Ardent experimenters will find much to interest them in both of these publications.

## Hamads

- Eight lines free to all W.I.A. members.
- \$6 per 3 cms. for other amateurs and S.W.I.'s.
- Copy should be in block letters or typescript, signed and forwarded to The Editor, P.O. Box 150, Toorak, Vic., 3142.
- Excludes commercial advertising.
- Closing date for Hamads is the 3rd day of the month preceding publication.
- OTHR means the advertiser's name and address are correct in the current Australian Callbook.

### WANTED TO SELL

**Yessu FT200** complete with HD home built power supply, new 6J58B final, only 5 months old in brand new condition \$320. ONO. VK3JUT OTHR.

**TCA 1674 Loband FM, Mobile Transceiver, 3/20 final.** Clean condition. Recently in service, unconverted. I will pack; you pay freight, \$13.00. VK4ZTK, OTHR.

**Philips FM608** mobile transceiver, 2m Fm, 5 cns, Cns. A, B, C, Inc. 28 W output, latest fully solid state TX from Philips, wide band filter, tone calling, reflectometer protected final, handbook and mobile mount provided; excellent unit, \$175. ONO. VK4ZML, OTHR. Ph.: (072) 56-3807.

**Sideband TX.** E. A. Jan-Mar 1967, mech. filter type, solid state, all band \$60. **Linear-2** x 6148's \$30. **BC-348 RX** \$40. **Bad** issues EA 61-66 linear.

**VC2BAK, OTHR.** (1973 call book). Ph.: (02) 48-6241.

**50' Ball Support Two Section Mast.** Good cond. Base included \$90. Ph.: (AM) 53-1357.

**Swan 120 Transceiver** and power supply, excellent condition. What offers? VK2ABC, OTHR. Ph.: (02) 451-1312.

**Australian EEB:** Bound volumes for sale, 1971, 1972, 32 each. A new 1970 at \$2.50. VK7RG, OTHR.

**2m FM Carphone,** solid state, (ex AR Mar/April, 1971). 5 channels A, B, C, 1 and 4. TX 12w output. RX extremely high sensitivity. Completely aligned. Perfect condition includes Selling Lee 14MHz loaded 5/8 whip. \$195. VK3ATV, OTHR. Ph.: (03) 232-6662. AH.

**Video Tape Recorder Ampex** type VR650, 2 inch helical, approx. 20 K, set of tape, 500 O.N.O. **Teletype** model 14FRX Typing report and TX \$35. **Video** 1 inch new \$20. **Television** sideband response analyser and sweep generator type-BW5 \$150.00. VK2ZPM, OTHR. Ph.: (02) 476-2304.

**Heath VFO,** model VF-3, 10-150 plus 11 metres \$8. R. J. Flanagan, VK3CR, OTHR. Ph.: (03) 772-4039.

**Edystone RX "888A"** Amateur bands only. Excellent condition, 160-10 metres with circuit and service manual, \$120.00 O.N.O. D. Johnston, c/- Prince Henry Hospital, Little Bay, N.S.W. Phone Sydney 661-0111 Ext. 239.

**A WA MRSA Carphone,** Channels A, B, 4, \$50.00. **Vinten BTR** 10 to 50 Watt Base Station, Channels A, B, 4, switching for four channels \$75.00.

**A WA MR20 Carphone** on 52.525 FM-6148 final, 35 watts—includes crystals, \$35.00.

**Alan Bradley, VK3LV, C/C Box 520, Geelong, or Ph.: Melb. 341-2452 BH.**

### WANTED

**Morse Keys,** Clispal, Simplex auto, PMG and others. Any condition, write VK4SS, 35 Wynnot Street, West End, Brisbane, 4101.

## You and DX

Many readers turn first to this page and are disappointed to see very little in this column even though the sunspot cycle is getting so low that 20M has become a day-time band, 15M and 10M are open spaces and cases to be found on 40, 80 or 160 at night. This leaves aside any DX through OSCAR-6 and successors.

What is the news of impending DX-peditions, QSL addresses and the other cheap's prowlings in hooking a new one? Or has everyone been reduced to tag-chewing with set stations on pre-arranged skeds to the exclusion of DX which is probably not there anyway?

To run a DX column requires a bit of effort, intimate contact with conditions and an 'ear to the ground' it also requires the possession of some ink wherever it writes.

If there is no VOLUNTEER to write a regular column for AR could you, yes YOU the reader of this, put pen to paper when you feel an itch in your writing fingers? This is the kind of thing to send in so that many such paragraphs from different sources could be added together (after edit) to make up a pot-pourri column —

**VK3ZZ** worked **Fred, XXXTX** on Sept. 28th on 14230 SSTV at 13.30 hours K and exchanged pictures of rare quality. Fred showed one picture of a world record caskew nut grown in his garden. **VK3ZZ** capped this with his picture of the world's smallest paw-paw plucked from his very own tree. Band conditions to Africa were otherwise poor but Steve lives. **VK3ZZ** no less and hear 5757U working 5757U on 14105 giving QSL address as 48UIT.

Note the third-person usage and brevity. Write it out legibly on any old piece of paper, even a 610 note would do, but do not forget in this case to ask for a refund of the 7 cent stamp you used.

One itchy-fingered paragraph from ten DX-chasers would make a DX column provided each did not write about the same choice morsel. So how about it?

The DM-OSL-Bureau has sent out a circular stating that several DM-stations will be using the special prefix DT from May to December 1973 to mark the 50th anniversary of amateur radio sport in the German Democratic Republic.

## Intruder Watch

with Alf Chandler VK3LC

1536 High Street, Glen Iris, 3146

Reference the summary published in last month's Magazine I now have both the RSGB and the ARRL doing similar summaries, but they have opted to do their summaries monthly and include any intruders reported by VK, so it looks as though I shall have to come up with more summaries.

An indication of how useful they are to Members would be appreciated, and also any suggestions as to layout and information supplied would be useful to me. The ARRL Monitoring System Region C co-ordinator GB2IW the following comments are appropriate, and I quote —

In view of the success of the Intruder Watch monthly summaries and the resultant increased distribution, the previously issued six monthly summary of intruders has been discontinued. More information has been included where possible including reports received from sources within IARU-ITU Regions 2 and 3. Every effort has been made to reject reports arising from receiver images, IF breakthrough, cross modulation etc, and where possible are checked on independent receivers and antennas. In reference to the VK reports more information is required on the following items — 14018 4CU; 14022 NAP; 14061 4CU de CL430; 14071 UMG72; 14082 741; 14144 BC224 (also 14153); 14345 FAL. Beam headings would also be appreciated.

If Members hear any of these stations, and can get a fix on them please notify your co-ordinator and supply reports. The co-operation between Societies is to be commended and encouraged. By reports received it would seem that we have enticed the engineers concerned to cure the spurious emission from the station 3DN. This station is controlled from New Zealand, and is situated at Nadi airport.

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# C.G.S

## TYPE C MINIATURE VITREOUS ENAMELLED POWER WIREWOUND RESISTORS

Approved to BS 9114 - N002 style 2E-56

### SPECIFICATIONS

The 'C' Series of miniature wirewound, vitreous enamelled resistors has been designed to meet the requirements of Specification BS 9114 - N002, and full Qualification Approval has been granted. A Test Report Summary is available on request; this report shows that many of the performance levels are in fact much higher than the specification acceptance levels.

The use of specially selected materials, combined with the application of exacting quality control throughout all stages of production ensures the consistent achievement of a very high standard of reliability.

#### ELECTRICAL SPECIFICATION

**Tolerance:**  $\pm 5\%$  is standard on values of  $1\Omega$  and above and  $\pm 10\%$  between  $0.1\Omega$  and  $1.0\Omega$ . For non standard values and tolerances please consult the factory.

**Resistance values:** C Series resistors are available with the preferred ohmic values of the E24 Series within the ranges shown in Table 1.

**Temperature coefficient:** Typically less than  $100 \text{ ppm}/^\circ\text{C}$  and never exceeding  $200 \text{ ppm}/^\circ\text{C}$  over the category temperature range  $-55^\circ\text{C}$  to  $+200^\circ\text{C}$

#### MATERIALS

**Core:** High purity steatite ceramic. Chemically inert, capable of withstanding severe thermal shock and impervious to moisture. Ground to close tolerance finish to give maximum contact with wire element for rapid heat transfer.

**Resistance Element:** High quality nickel-chrome or nickel-copper alloy depending on resistance value; wound at minimum tension.

**End Caps:** Formed to close tolerances from a special nickel-iron alloy chosen for its consistent welding properties and glass sealing characteristics.

**Leads:** Solder coated nickel A.

Uncoated leads can be supplied for welding.

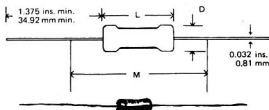
Specify - 'weldable leads'.

Preformed and cropped leads can also be supplied on request.

**Coating:** Humidity proof vitreous enamel with carefully controlled expansion matched to the materials of the resistor.

TABLE 1

C.G.S.				BS 9114 - N002							STYLE CROSS REFERENCE		
Style	Maximum wattage rating @ 20°C	Resistance Range Ω		BS 9114 - N002 Style	Maximum wattage rating @ 70°C	Approved Resistance Range Ω		Critical Resistance Ω	Limiting Element Voltage, Volts		DEF. 5111-1 Style	DEF 5115-2 Style	G.P.O. Style
		min.	max.			min.	max.		Normal	Low Air Pressure			
C3A	3	0.1	10K	2E-56-2E	2.5	1	4.7K	3.9K	100	70	RWV3J	RFH3-2.5	P.O.35
C7	7	0.1	27K	2E-56-6	6	1	15K	6.8K	200	140	RWV4J	RFH3-6	P.O.40
C10	10	0.1	68K	2E-56-9	9	1	68K	27K	500	350	RWV4K	RFH3-9	P.O.36
C14	14	0.2	120K	2E-56-12	12	1	100K	47K	750	530	RWV4L	RFH3-12	—



Note: M = resistance measuring points distance - below  $100\Omega$  only.

TABLE 2

Style	Length L		Diam. D		Measuring Distance M		Approx. Weight grammes
	max. in.	max. mm.	max. in.	max. mm.	$\pm 0.062$ in.	$\pm 1.59$ mm.	
C3A	.499	12.7	0.220	5.6	1.250	31.8	1.0
C7	.874	22.2	0.315	8.0	1.625	41.3	2.0
C10	1.499	38.1	0.315	8.0	2.250	57.2	3.5
C14	2.106	53.5	0.315	8.0	2.875	73.0	5.0





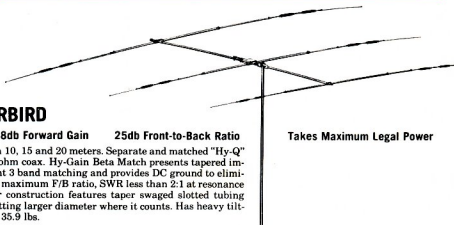
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### NEW, IMPROVED SUPER 3-Element THUNDERBIRD

◆ New "Hy-Q" Traps Up to 8db Forward Gain 25db Front-to-Back Ratio

Takes Maximum Legal Power

Delivers outstanding performance on 10, 15 and 20 meters. Separate and matched "Hy-Q" Traps for each band. Feeds with 52 ohm coax. Hy-Gain Beta Match presents tapered impedance which provides most efficient 3 band matching and provides DC ground to eliminate precipitation static resulting in maximum F/B ratio, SWR less than 2:1 at resonance on all bands. Mechanically superior construction features taper swaged slotted tubing allowing easy adjustment and permitting larger diameter where it counts. Has heavy tilt-able boom to mast clamp. Shpg. Wt. 35.9 lbs.



### FABULOUS THUNDERBIRD JUNIOR

◆ Up to 8db Forward Gain 25db Front-to-Back Ratio  
◆ Takes up to 300 Watts AM; 600 Watts P.E.P.  
◆ Rotates with Heavy Duty TV Rotator Turning Radius 14.3 ft.

If you're looking for top performance on 10, 15 and 20 meters but are hampered with severe space limitations, you'll want the Model TH3JR. Constructed of durable, lightweight taper-swaged aluminum tubing, the Model TH3JR is ideal for rooftop or lightweight tower installations. Separate and matched "Hy-Q" traps for each band. Feeds with 52 ohm coax - Beta Matched for optimum gain, maximum F/B ratio without compromise. SWR less than 2:1 at resonance on all bands. Molded high impact cyclocac insulators - all hardware iridite treated to MIL specs. Shpg. Wt. 20.4 lbs.



#### SPECIFICATIONS

##### ELECTRICAL

Gain  
Front-to-Back Ratio  
Maximum Power Input

##### Model TH3Mk3

8db  
25db  
1 KW, AM  
Less than 2:1  
52 ohms

##### Model TH3JR

8db  
25db  
300 Watts AM;  
600 Watts PEP  
Less than 2:1  
52 ohms

##### MECHANICAL

Longest Element  
Boom Length  
Turning Radius  
Wind Load At 80 MPH  
Maximum Wind Survival  
Net Weight  
Mast Diameter  
Surface Area

27 ft.  
14 ft.  
15.7 ft.  
103.7 lbs.  
100 MPH  
36 lbs.  
1 1/4" to 2 1/2"  
4.03 sq. ft.

24.2 ft.  
12 ft.  
14.3 ft.  
87.0 lbs.  
80 MPH  
21 lbs.  
1 1/4" to 1 1/2"  
3.4 sq. ft.

#### TRIBANDER BALUN



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